Appendix D Field Cost Estimates

Priest Rapids Intake, Pumping Plant, Switchyard and Inflow Conveyance System Q= 3,500 cfs

Field Cost Estimate

FEATL	JRE:			PROJE					
		s Intake, Pumping eyance System - (Plant, Switchyard, and		Yakima Rive	er Basin V	Water Storage	Options	
inilow	Conve	yance System - v	Q= 0,000 6ls	REGION	PN	PRICE	LEVEL:	Appraisal	
Summar	mmary Sheet 1 of 2				C:\Documents ar Revisions\[Priest	lack Rock\Black Rock pinary			
PLANT ACCOUNF	PAY ITEM		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT	
		and Two Types of Dis Discharge 1: Tu	Identify One Type of Intake and Pump scharge Line Options nnel/Tunnel Inflow Line to BRR nnel/Pipeline Inflow Line to BRR	ping Plant					
		OPTION 1: PUMPI	NG PLANT PLUS DISCHARGE 1: TU	I JNNEL/TU	UNNEL.				
		Intake - Civil/Structura	al Subtotal	-				\$48,109,150.00	
		Intake - Mechanical/E	lectrical Subtotal					\$9,926,770.00	
		Plant - Civil/Structural	Subtotal	 -				\$63,295,370.00	
		Plant - Mechanical Su	btotal			·		\$93,929,850.00	
		Plant - Electrical Subt	otal					\$5,413,850.00	
·		Switchyard & Transm	ission Line Subtotal					\$20,280,000.00	
·		Discharge 1 - Subtotal		-	· · · · · · · · · · · · · · · · · · ·			\$186,471,700.00	
		Subtotal						\$427,426,690.00	
		Mobilization	+/	5%				\$21,000,000.00	
		Subtotal w/ mobilizati	on					\$448,426,690.00	
· · : · ·		Unlisted Items	+/	- 10%				\$41,573,310.00	
		OPTION 1: CONTR	ACT COST	-				\$490,000,000.00	
· · · 		Contingencies	+/	25%				\$130,000,000.00	
		OPTION 1: FIELD O	COST					\$620,000,000.00	
		QU	IANTITIES			P	RICES		
BY			CHECKED	BYG	Craig A. Grush Elizabeth Tran		CHECKED がか	6/:1/04	
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FEATU	ATURE:				PROJECT:						
Priest A	est Rapids Intake, Pumping Plant, Switchyard, and ow Conveyance System - Q= 3,500 cfs				Yakima Riv	er Basin V	Vater Storage	Options			
IIIIOW C)Oi 146	yance bystem c	x- 0,000 dio	REGION	PN	PRICE	LEVEL:	Appraisal			
Summary	y Shee	t 2 of 2					vanotte\Desktop\B 3500 Rev 1.xls Su	lack Rock\Black Rock mmary			
NT CNT	ТБМ			CODE	OUANTITY	UNIT	UNIT PRICE	AMOUNT			
PLANT	PAY ITEM	l	DESCRIPTION	CODE	QUANTITI	UNIT	ONII PARJIS	AMOUNT			
			<u></u>				<u></u>				
		OPTION 2: PUMPIN	NG PLANT PLUS DISCHARGE 2: TU	NNEL/PI	PELINE						
		Intake - Civil/Structura	d Subtotal		·			\$48,109,150.00			
		Intake - Mechanical/El	ectrical Subtotal			ļ		\$9,926,770.00			
	·	Plant - Civil/Structural	Subtotal					\$63,295,370.00			
		Plant - Mechanical Sul	ntotal			<u> </u>		\$93,929,850.00			
	<u></u>	Plant - Electrical Subt	otal					\$5,413,850.00			
		Switchyard & Transmi	ssion Line Subtotal			<u></u>		\$20,280,000.00			
		Discharge 2 - Subtotal						\$357,838,420.00			
		Disentinge D Suivertain									
	<u> </u>	·			<u></u> .			<u> </u>			
		Subtotal						\$598,793,410.00			
		Mobilization	 +/-	 5%				\$30,000,000.00			
					·-···						
		Subtotal w/ mobilization	<u>on</u>					\$628,793,410.00			
. _		Unlisted Items	+/-	10%				\$61,206,590.00			
		OPTION 2: CONTRA	ACT COST					\$690,000,000.00			
··											
		Contingencies	+/-	25%				\$170,000,000.00			
		OPTION 2: FIELD C	COST					\$860,000,000.00			
			···								
						<u> </u>		··· ···			
		OII	ANTITIES			P	RICES				
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FEAT Priest		s Intake, Pumping Plant, Switchyard, and	PROJE		er Basin V	Vater Storage	Options
Inflow	Conve	eyance System - Q= 3,500 cfs	REGION	PN	PRICE	LEVEL.	Appraisal
			FILE.				
Intake-	Civil		1			vanotte\Desktop\B1 3500 Rev 1.xls Sun	ack Rock\Black Rock
PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	_	CIVIL					
	<u> </u>	Construct/Remove Cellular Cofferdam around Reservoir					<u> </u>
		Assume construct from shore without barge.	i ilitake				
		Assume circular cellular cofferdam.					
		Length= 380 feet, 32-ft dia. cells, 28 ft high					
<u> </u>		Top of cofferdam - El. 488, Bottom of cofferdam -	I EL 460		 		
		Assume top of rock at reservoir bottom	1. 400				
	.	Assume top of rock at reservoir bottom.					
			P0100			62.200.00	61 221 800 00
		Furnish and install sheet pile walls	D8120	555	TONS	\$2,200.00	\$1,221,000.00
L		Arbed AS 500-12, 30 psf			G)/	#20.00	#251 000 00
		Backfill cells with free-draining granular material	D8120	11,700	CY	\$30.00	\$351,000.00
	3	Unwater behind cofferdam	D8120	6	MOS	\$55,000.00	\$330,000.00
		Assume sumps and surface pumps			ļ.		
	ļ	<u> </u>					
	<u> </u>						
		Remove Coffcrdam					
[- 4	Remove and stockpile granular material	D8120	11,700	CY	\$25.00	\$292,500.00
	:	Extract and salvage sheet pile cutoff wall	D8120	555	TONS	\$300.00	\$166,500.00
							
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	<u> </u>	<u></u>					ļ
	<u> </u>	<u></u>					
					<u> </u>		
	.						
		Sheet Subtotal					\$2,361,000.00
		QUANTITIES			P	RICES	
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FEATI		s Intake, Pumping Plant, Switchyard, and	PROJE		er Basin '	Water Storage C	Options
		yance System - Q= 3,500 cfs		<u>.</u>	 		
			REGION	PN	PRICE	LEVEL:	Appraisal
Intake- :	Structur	al	FILE:			ovanotte\Desktop\Black 3500 Rev 1.xls Sumr	
PLANT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Structural Excavation and Backfill					
		Assume dam excavation is all common.					
	<u> </u>	Assume top 5 feet of excavation is common and the remain	der is rock		[
	· ·	Assume stockpile and use for backfill or embankment.					
	7	Excavation of common materials for structures	D8140	388,500	CY	\$6.00	\$2,331,000.00
	8	Excavation of rock for structures (drill & shoot)	D8140	671,700	CY	\$15.00	\$10,075,500.00
	9	Furnish & place backfill for structures (assume local borrow)	D8140	35,800	CY	\$4.00	\$143,200.00
	10	Place backfill around structures	D8140	35,800	CY	Included above	
	11	Compact backfill around structures	D8140	35,800	CY	\$5.00	\$179,000.00
	<u></u>						
	1	Roads and Fencing		2.030		620.00	#45 400 Br
	!2	Gravel surfacing		2,270	TONS	\$20.00	\$45,400.00
		20 ft wide road right side of channel					
		12 ft wide road left side of channel			<u> </u>		
	13	Safety fencing		4,750	LF .	\$20.00	\$95,000.00
		8' chainlink fence					
	<u></u>		-				
		STRUCTURAL				 	
	1	Construct Gated Intake and Fishscreen Structure					
	1.4	Furnish, form, and place reinforced concrete (fc=4ksi)	D8140	40,150	CY	\$350.00	\$14,052,500.00
		Furnish and place concrete reinforcement.	D8140	6,424,000	LBS	\$0.75	\$4,818,000.00
		Furnish and handle cement	D8140	11,325	TONS	\$110.00	\$1,245,750.00
		Torrish and handle center		11,020			
		Construct Lined Intake Canal					
	17	Purnish, form, and place unreinforced concrete	D8140	2,350	CY	\$350.00	\$822,500.00
		lining in excavated channel (fc= 3 ksi)				1	
	1,8	Furnish and handle cement	_D8140	665	TONS	\$140.00	\$93,100.00
	ļ	Construct Bypass Pipe				#22D 00	#5 227 200 00
	19	3 - 54" Dia. steel pipe for fish bypass.	- - ·	15,840	LF	\$330.00	\$5,227,200.00
		Mortar line pipe	-	270 000		#5 00	#1 250 000 00
		Bypass pipe common excavation		270,000	CY	\$5.00	\$1,350,000.00
<u> </u>		Bypass pipe rock excavation		130,000	CY	\$15.00	\$1,950,000.00
		Bypass pipe backfill		380,000	CY	\$7.00	\$2,660,000.00
	23	Bypass pipe soil cement bedding (100 psi)		12,000	CY	\$55.00	\$660,000.00
		Miscellaneous Metalwork	 				
	†	Listed under Intake - Mechanical Items					
			Ī				
		Intake - Civil/Structural Subtotal					\$48,109,150.00
		QUANTITIES			P	RICES	
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	est Rapids Intake, Pumping Plant, Switchyard, and ow Conveyance System - Q= 3,500 cfs				Yakima Rive	r Basin V	Vater Storage Op	otions
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Intake	- Mechar	ical		FILE:			vanotte\Desktop\Black 3500 Rev 1.xlsjSumm	
	T							
PLANT ACCOUNT	PAY ITEM		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Mechanical				·		
	-	Evenish and install r	steel stoplog guides and seats	D8410	13,500	LBS	\$6.00	\$81,000.0
	- ·	(upstream of radial		-	15,500	2.50		401,000.0
		(apsireasi of radia)						
		Furnish and install s	steel trashracks	D8410	102,000	LBS	\$4.00	\$408,000.0
	3	Furnish and install of	one trash rake, rails, supports	D8410	21,000	LBS	\$10.00	\$210,000.0
		(assume Atlas Polar	DT8300 rake)				<u> </u>	
	4	Furnish and install o	one conveyor, steel	D8410	13,000	LBS	\$10.00	\$130,000.0
	_							th. 440,000 c
	5		steel fish screen guides, supports,	D8410	360,000	LBS	\$4.00	\$1,440,000.0
	-	embedded seats, and	a bypass wans				1	
		Furnish and install t	fish screens, 10' W x14' H panel	D8410				
	- "	70 panels + 6 spares						•
	. .	Structural steel	· · · · -		106,400	LBS	\$4.00	\$425,600.0
	-	Stainless steel			106,400	LBS	\$15.00	\$1,596,000.0
								
	7	Furnish and install l	parrier panels above fish screens	D8410				
		10' W x 11' H panel	s, 70 panels + 6 spares					
		Structural steel			209,000	LBS	\$4.00	\$836,000.0
							<u></u>	
	8		adjustable baffle panels	D8410			_	
l		· · · · · · · · · · · · · · · · · · ·	s, 70 panels + 6 spares		570,000		\$4.00	
	. }	Structural steel			570,000	LBS	\$4.00	\$2,280,000.0
ŀ		Furnish and install t	lish screen cleaners with travel rail,	D8410			<u> </u>	
ļ —	7	 	ush cleaner arms per system					
	1	a. Structural steel	ost creater arms per system		40,000	LBS	\$4.00	\$160,000.0
		b. Stainless steel			2,500	LBS	\$20.00	\$50,000.0
		c. 2 Hp motors/gear	reducers, with adj. speed		5	UNITS	\$5,000.00	\$25,000.0
		controllers, and lim						
	10	Furnish and install	water level measuring systems	D8410	12	UNITS	\$11,000.00	\$132,000.0
						ļ		
								\$5 552 £00 0
			Sheet Subtotal QUANTITIES		<u>L</u>	<u> </u>	RICES	\$7,773,600.0
<u> </u>				D.F.1 .		r'	F	
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	Rapids	s Intake, Pumpin yance System	ng Plant, Switchyard, and - Q= 3,500 cfs	PROJE		r Basin	Water Storage	Options
	001110	yanos eyetem	<u> </u>	REGION	PN	PRICE	LEVEL:	Appraisal
Intake-	ake- Mechanical						bvanotte\Desktop\B1 _3500 Rev 1.xls Sur	ack Rock\Black Rock nmary
PLANT	PAY ITEM		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Mechanical (cont)						
	11	Furnish and install st (downstream of fish	screens)	D8410	13,500	LBS	\$6.00	\$81,000.0
	. 12	Furnish and install o different size bays w	ne set of steel stoplogs for the two hith lifting beam	D8410	101,000	LBS	\$4.00	\$404,000.0
	13	3' wide walkway, ste	eel, safety grating along fish screens	D8410	19,500	LBS	\$7.00	\$136,500.0
		Handrail along each	side of fish screen walkway	D8410	1,520	LF	\$50.00	\$76,000.0
		Radial Gates in Int	ake Structure					
		Furnish and install to radial gates and hois	wo 36.5-ft x 8.5-ft top seal	D8420				
	15	Gate (Weight/gate=			69,120	LBS	\$8.00	\$552,960.0
		 	rk (Weight/bay= 5,000 lbs)		10,000	LBS	\$5.00	\$50,000.0
	17	Hoist operator (Wei	ght/gate operator= 11,300 lbs)		22,600	LBS	\$20.00	\$452,000.0
	18	Motor - 5 hp (One p	oer gate)		2	EA	Included in op	erator \$
	 .	Furnish and install or	one 15.0-ft x 8.5-ft top seal equipment:	D8420				
	19	Gate (Weight/gate=	(20,790 lbs)		20,790	LBS	\$8.00	\$166,320.0
	20	Embedded metalwor	rk (Weight/bay= 3,000 lbs)		3,000	+	\$5.00	\$15,000.0
			ght/gate operator= 6,150 lbs)		6,150		\$20.00	\$123,000.0
	22	Motor - 3 hp			1	EA	Included in op	erator \$
								42 DEC 500 C
			Sheet Subtotal				RICES	\$2,056,780.0
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BY		ensen/B Sund (D8410) nan (D8420)	CHECKED AMR	BY C	Craig A. Grush		CHECKED \$0. PEER REVIEW	1 8/19/04
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	Rapids	s Intake, Pumping Plant, Switchyard, and	PROJE		er Basin '	Water Storage O	ptions		
Inflow	Conve	yance System - Q= 3,500 cfs	DEGIGL		DDI (III)				
			REGION	N PN PRICE LEVEL: Appraisal CADocuments and Settings\bvanotte\Desktop\Black Rock\Black Rock Revisions\Priest Rapids PP_3500 Rev 1.xls\Summary					
Intake- I	Γ" "	al		Revisions\{Priest	Rapids PP_	_3500 Rev 1.xls]Summ	агу		
PLANT ACCOUNT	РАҮ ПЕМ	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
		ELECTRICAL			<u> </u>				
	i		D0420		 	·			
		Service Equipment (F&I)	D8430		EA	\$25,000.00	 \$25,000.00		
		Distribution panelboard, outdoor type	.		EA	\$25,000.00	.\$25,000.00		
		480 volts, 3-phase with 225 ampere bus							
	24	Outdoor transformer load center		1	EA	\$11,000.00	\$11,000.00		
		15 kVA, 1-phase, 480-240/120 volt							
				İ		T			
		Combination Motor Starters	D8430						
	25	NEMA size 2 non-reversing contactor,		6	EA	\$8,000.00	\$48,000.00		
		480-120 volt control transformer		I	}				
		NEMA type 4 enclosure							
	ļ								
	<u> </u>	Insulated Conductors (F&I)				1			
		600-volt, single-conductor, stranded copper	·	500		#0.00	#200.00		
	26			500		\$0.60	\$300.00		
	27	10 AWG		200	+	\$0.70	\$140.00		
	28	8 AWG		100		\$1.00	\$100.00		
··		Conduit System (F&I)		· ·		+			
		Rigid steel conduit				1			
	29	· · · · · · · · · · · · · · · · · · ·		150	LF	S15.00	\$2,250.00		
	1			· · · · · · · · · · · · · · · · · · ·					
· ·· ··									
	l								
		Lighting System (F&I)	D8430						
	30	High-pressure sodium, pole mounted, outdoor		6	EA	\$1,600.00	\$9,600.00		
		70 watt, 120 volt	1						
			ļ			1			
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		Intake - Mechanical/Electrical Subtotal				 	\$9,926,770.00		
		QUANTITIES	<u> </u>		Р	RICES			
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Plant- (Civil					anotte\Desktop\Blac 500 Rev 1.xls Sumi	ck Rock\Black Rock nary
PLANT	PAYITEM	DESCRIPTION	CODE	QUANITTY	UNIT	UNIT PRICE	AMOUNT
	<u> </u>	Access Road (9.75 miles of 2-lane access road):	 		!		
		Assume construct access road from SH24 to PP.	1		<u> </u>		
	ļ	Assume place road along abandoned railroad alignment	<u> </u>				
		Assume no major excavation or embankment sections.					
		Clear roadway alignment	D8140	45	AC_	\$3,500.00	\$157,500.00
	2	Furnish and place base course material (9-inch depth)	D8140	96,000	TONS	\$16.00	\$1,536,000.00
	3	Furnish and place asphalt concrete (6-inch depth)	D8140	70,000	TONS	\$60.00	\$4,200,000.00
	4	Furnish and install W-beam type guardrail	D8140	10,000	LF	\$25.00	\$250,000.00
	5	Furnish and install miscellaneous pipe culverts	D8140	1,000	LF	\$200.00	\$200,000.00
·	ļ <u> </u>	Assume 36-inch-diameter, wt/ft= 35#/ft)					
		Service Yard (6" asphalt concrete surface)	 				
<u></u>	6	Strip and clear pumping plant site to 1 foot depth	D8120	15,300	CY	\$3.00	\$45,900.00
	_	Common excavation to Service Yard El. 505.0	D8120	164,000	CY	\$5.00	\$820,000.00
	- 1	Rock excavation to Service Yard El. 505.0	D8120	208,000	CY	\$15.00	\$3,120,000.00
		Place and compact embankment for service yard	D8120	19,200	CY	\$8.00	\$153,600.00
		Furnish and place base course material (6-inch)	D8120	10,000	TONS	\$20.00	\$200,000.00
		Furnish and place asphalt concrete (6-inch)	D8120	11,000	TONS	\$80.00	\$880,000.00
	-+	Prinish and install 7-foot chain link fence for PP Yard	D8120	3,100	LF	\$20.00	\$62,000.00
		Furnish and install 7-foot x 24-foot access gate	D8120	3	EA	\$3,500.00	\$10,500.00
	- '-	Turnish and instant 7 NACA 2 + Tool (decess) gate	20120	-			
		Dewatering During Construction:					
	Ţ	Assume no groundwater flows into excavation.	 				
		Structural Excavation and Backfill					
l		Assume all common material excavated under site excavation	on for yard.				
l	 	Assume stockpile rock for later use as riprap or rockfill.	· · · ·				
	-		<u> </u>			1	
		Excavation of rock for structures (drill & shoot)	D8120	200,000	CY	\$15.00	\$3,000,000.00
	I	Furnish backfill for structures (assume local borrow)	D8120	40,000	CY	\$4.00	\$160,000.00
	-+	Place backfill around structures	D8120	40,000	CY	Included above	;
	17	Compact backfill around structures	D8120	40,000	CY	\$5.00	\$200,000.00
	·	Rock Exc. for manifold pipe to edge of Service Yard	D8120	78,000	CY	\$15.00	\$1,170,000.00
	19	Furnish, place, & compact backfill for manifold pipe trench(assi	n D8120	63,480	CY	\$9.00	\$571,320.00
		Furnish & place soil cement for manifold pipe trench	D8120	8,160	CY	\$55.00	\$448,800.00
ļ	 	Sheet Subtotal	 				\$17,185,620.00
\vdash		QUANTITIES	╅┈		PF	RICES	
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FEAT	URE:		PROJE	CT:	<u></u>			
		s Intake, Pumping Plant, Switchyard, and eyance System - Q= 3,500 cfs		Yakima River	Basin Wa	ater Storage Op	tions	
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Plant- S	Structura	al				ettings\bvanotte\Desktop\Black Rock\Black Rock oids PP_3500 Rev 1.xis Summary		
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT	
	. 					·		
	 	STRUCTURAL						
	·	Construct Building Structure						
	21	Furnish, form, and place reinforced concrete	D8120	91,300	ÇY	\$350.00	\$31,955,000.00	
		Furnish and place concrete reinforcement.	D8120	10,043,000	LBS	\$0.75	\$7,532,250.00	
-		Assume 110 #/CY						
	23	Furnish and handle cement (.2821/CY)	D8120	25,750	TONS	\$110.00	\$2,832,500.00	
		Furnish & install precast, prestressed double tees for roof						
	24	10LDT 32+2 = 10' wide & 32" deep - 80' Span	D8120	36	EA.	\$50,000.00	\$1,800,000.00	
	_					-		
								
			<u> </u>			<u> </u>		
					. ——			
		Structural Steel						
	1 25	Furnish and install structural steel (painted):	D8120	60,000	LBS	\$4.00	\$240,000.00	
		crune rails, baseplates			13.50		42 10,000.00	
		orane rans, suspinies						
			···					
	-							
· · · · · · · · · · · · · · · · · · ·		Miscellaneous Metalwork						
	26	Furnish and install miscellaneous metalwork	D8120	250,000	LBS	\$7.00	\$1,750,000.00	
		Includes gratings, hatches, ladders, guardrails,						
		catwalk, and cable trays and supports						
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		· · · · · · · · · · · · · · · · · · ·						
		Plant - Civil/Structural Subtotal					\$63,295,370.00	
		QUANTITIES			PR	ICES		
BY	M. R. O	Shea CHECKET	BY (Craig A. Grush		CHECKED 50	v 3/17/04	
DATE PI	REPAREI	D PEER REVIEW	DATE PRE			prop promov		
	4/10/04			08/17/04			Hed 1	

	Rapid:	s Intake, Pumping Plant, Switchyard, and	PROJEC		Basin W	uter Storage Optio	ns
Inflow	Conve	eyance System - Q= 3,500 cfs	REGION	PN	PRICE	LEVEL:	Appraisal
Plant - N	Mechan	ical	FILE:	2:\Documents and	Settings\hv:	anotte\Desktop\Black Ro 500 Rev 1.xls Summary	
PLANT	PAY ITEM	DESCRIPTION	СОВВ	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Major Mechanical Equipment					
		Prices below telephone quote from Bob Rittase, Voith Hydro, 7	17-792-7206				
		1500 5					
		500 cfs two-stage spiral case pump, rated 500cfs at 1430 ft total dynamic head, ov verall efficiency more than 83%			-		
	 	operating range from 1030 to 1430 feet					
	ļ. 1	Pumps		3	EA	\$5,000,000.00	\$15,000,000.00
	,	Motors	+ +	3	EA	\$2,500,000.00	\$7,500,000.00
	, ,	Spherical discharge valves, with operators, rated at 1500 ft				1	474500,000
	3	working pressure and 12000 ft surge pressure, with operators			EA	\$3,000,000.00	\$9,000,000.00
		Installation supervision of 500 cfs pumping unit	 	3	EA	\$1,000,000.00	\$3,000,000.00
		Installation supervision of 500 on pumping unit		· · · · · · · · · · · · · · · · · · ·			
		1000 cfs two-stage spiral case pump, rated 1000 cfs at 1430 ft					
		total dynamic head, overall efficiency more than 83%					
		operating range 1030 to 1430 ft					
	5	Pumps		2	EA	\$9,000,000.00	518,000,000.00
	6	Motors			EA	\$4,500,000.00	\$9,000,000.00
		Spherical discharge valves, with operators, rated at 1500 ft			ļ		
	7	working pressure and 12000 ft surge pressure, with operators		2	EA	\$4,500,000.00	\$9,000,000.00
	8	Installation supervision of 1000 efs pumping unit		2	EA	\$1,500,000.00	\$3,000,000.00
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		Sheet Subtotal	1			PRICES	\$73,500,000.00
		QUANTITIES	1 . 7				
BY	Richard	Fehr CHECKED	BY C	raig A. Grush		CHECKED 50√ €	117/04
DATE PREPARED 4/16/04		DATE PREP			PEER REVIEW	cal	

	Rapid	s Intake, Pumping Plant, Switchyard, and	PROJE		Basin W	ater Storage Optio	ons
Inflow	Conve	eyance System - Q= 3,500 cfs	REGION	PN	PRICE 1	LEVEL:	Appraisal
Plant - N	Mechan	ical	FILE:	C:\Documents and S	Settings\bva	ranoite\Desktop\Black Rock\Black Rock 500 Rev 1.xls Summary	
PLANT	РАҮ ПЕМ	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		FURNISH-AND-INSTALL THE FOLLOWING:					
		Steel Manifold and Suction Tubes Steel plate used for pipe fabrication: ASTM A572 Gr. 50: Sy = 50 kpsi St = 65 kpsi	D8420				
	9	(All pipe sizes are inside diameters) 192" Inside Dia., 3 5/8" wall, L= 340 ft.	D-8420	2,600,000	LBS	\$2.00	\$5,200,000.00
· · · ··	10	192" Dia., 3 ³ / ₄ " wall, L= 152 ft.		1,200,000	LBS	\$2.00	\$2,400,000.00
	11	175" Dia., 3 ³ / ₈ " wall, L= 58 ft.		375,000	LBS	\$2.00	\$750,000.00
	12	170" Dia., 1" wall, L= 134 ft.		260,000	LBS	\$2.00	\$520,000.00
	13	135" Dia., 2 78" wall, L= 54 ft.		210,000	LBS	\$2.00	\$420,000.00
	14	120" Dia., ⁷ I _S " wall, L= 122 ft.		150,000	LBS	\$2.00	\$300,000.00
	15	110" Dia., 2 1/8" wall, L= 261 ft.		670,000	LBS	\$2.00	\$1,340,000.00
 	16	78° Dia., $1^{-1}/_{2}^{\circ}$ wall, L= 260 ft.		340,000	LBS	\$2.00	\$680,000.00
		Sheet Subtotal					\$11,610,000.00
	·····	QUANTITIES			P	RICES	
BY Nathan Nakamoto, D8420 CHECKED		ву (Traig A. Grush		CHECKED Bov	8/17/04	
Rick Frisz, D8420 DATE PREPARED 4/16/04			DATE PREPARED 08/17/04 DATE PREPARED 08/17/04				

Priest F		s Intake, Pumping	Plant, Switchyard, and	PROJE		r Basin W	ater Storage Optic	ons
Inflow (Conve	eyance System -	Q= 3,500 cfs	REGION	PN	PRICE	LEVEL:	Appraisal
				FILE:	FIN	FRICE	LEVISC.	жүүлаза
Plant - M	1echan	ical					anotte\Desktop\Black Rc 500 Rev 1.xls]Summary	ck\Black Rock
TN:	ЕМ							
PLANT ACCOUNT	РАҮ ПЕМ		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
_								
		Mechanical (cont)				_		
	17	CO2 High Pressure Fig	re Extinguishing System:	D-8410	2	each	\$100,000.00	\$200,000.00
		16 - 100# Storage Cyli	nders w/ control panel					
		and appurtenances and	2,000 lbs. of					
		sch. 80 carbon steel pi	pe, valves & fittings					
	18	Fire Suppression Syste	·	D-8410	1	L.S.		\$200,000.00
				D-0410	<u> </u>	1		\$200,000.00
		10 Fire hose reels w/ 1 20 - Portable hand-hel						———
			carbon steel pipe, valves & fittings			 		
		 	se, 500 gpm @ 300 ft of head					
		i - Pire pump, spin-ca	se, 500 gpm @ 500 ft of head		<u></u>			
	19	Unit Cooling Water Sy	ystem:	D-8410	1	L.S.		\$250,000.00
			ps, end-suction type, 150 gpm					
		2 - 8-inch automatic, s						
			opper tubing, valves & fittings					
		1	on, mechanical joint pipe & fittings					
	20	Lubricating Oil Syster	n:	D-8410	<u>l</u>	L.S.		\$50,000.00
		2- 500 gal carbon steel	storage tanks					
		I - 10 gpm @ 100 psi	oil pump					.
		I - lube oil filter						
		3,000 lbs. of sch. 40 ca	arbon steel pipe, valves & fittings					
	21	Compressed Air Syste	m:	D-8410	ļ	L.S.		\$100,000.00
		2 - 100 cfm @ 125 ps	i rotary screw air compressors					
	ļ	1 - 250 gal, carbon ste	el air receiver					
		1 - 200 cfm air dryer						
		3,000 lbs. of sch. 40 ca	arbon steel pipe, valves & fittings					
		0				1.0		£100.000.00
	22	Service Water System		D-8410	ı	L.S.	· - ·	\$100,000.00
	·	1	o, 75 gpm @ 200 ft. of head					
	l	1 - Hydropneumatic T	opper tubing, valves & fittings					
		1,500 lbs. of type K co	pper tubing, valves & rittings					
	23	Gravity Drainage Syst	- <u></u>	D-8410	1	L.S.		\$300,000.00
	- 	50 - Floor drains, cast						
	l· ·		hub & spigot, service weight					
		soil pipe						
			Sheet Subtotal		······			\$1,200,000.00
		QL	ANTITIES			F	PRICES	
ВҰ			СНЕСКЕО	ву С	1		CHECKED A 4 1/	\$117/ob
	John Gra	SS	MR.		Haig A. Grush		Dan	07.13.
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FEATU Priest I		s Intake, Pumpir	ng Plant, Switchyard, and	PROJE		Basin W	ater Storage Optio	ons			
Inflow	Conve	eyance System	- Q= 3,500 cfs	REGION	PN	PRICE	LEVEL:	Appraisal			
Diant - M	Plant - Mechanical			FILE: C:\Documents and Settings\bvanotte\Desktop\Black Rock\Black Ro Revisions\\Priest Rapids PP_3500 Rev Lxls\Summary							
		loai			- Cevisions of frest b	apids 11_5c	(to tee v.xiajounitially				
LNOCODY LNVJ4	PAY ITEM		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT			
		Mechanical (cont)	· · · · · · · · · · · · · · · · · · ·								
			·								
	24	Plant Unwatering Sy	ystem:	D-8410	1	L.S.		\$200,000.0			
			type sump pump, 1000 gpm @ 50 ft hd			1					
		1 - Drainage jet type									
			copper tube, valves & fittings			-					
-			iron, mechanical joint pipe & fittings	1							
	l										
	25	Domestic Water and	Sanitary Waste System:	D-8410	I	L.S.		\$100,000.00			
		4 - Water Closets									
		2 - Urinal					L				
	·	4 - Lavatories & acc	essories								
		I - Duplex Sewage I	Ejector			ļ					
I			on hub & spigot service weight]					
	1	sewer pipe									
		 	opper tubing, valves & fittings								
	i	· · · · · · · · · · · · · · · · · · ·									
ľ											
			···								
							T				
	26	100-Ton overhead c	rane, 72'-6" span	D8410	153,000	LBS	\$6.00	\$918,000.00			
	27	200-Ton overhead o	rane, 72'-6" span, two required	D-8410	520,000	LBS	\$6.00	\$3,120,000.00			
						<u> </u>					
	28	Electric traction elec	vator	D8410	1	unit	\$500,000.00	\$500,000.00			
	ļ	overhead, geared, ca	pacity = 3500 pounds,								
	ļ	travel = 100 feet, las	ndings = 6, speed = 200 ft/min.								
ļ.											
:··	29	Ultrasonie flowmete	er, 4-path	D8410	1	meter	\$35,000.00	\$35,000.00			
						_					
l	30	Trashracks (steel) at	pumping plant	D8410	77,000	LBS	\$4.00	\$308,000.00			
ļ	ļ					<u> </u>					
_	31		ims and guides (steel)	D8410	45,000	LBS	\$4.00	\$180,000.00			
		(assumes one set of	stoplogs for each size bay)				· ·				
		-									
	-		<u></u>								
	<u> </u>	_				-					
			AN Colored			_		#5 2/1 AAA A			
	L		Sheet Subtotal				RICES	\$5,361,000.00			
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	************	Schlien, J. Grass	AMR		Craig A. Grush		PEER REVIEW				
DATE PR 4/16/2004		•	PEER REVIEW	DATE PRE	PARED 08/17/04		LEEN NEVIEW	Ned			
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FEATURE:				PROJECT: Yakima River Basin Water Storage Options							
Priest i Inflow (rapid Conve	s Intake, Pumping Plant, Switchyard, and eyance System - Q= 3,500 cfs		Yakima Kivei	Basın W	ater Storage Optic	ons				
		.,	REGION	l PN	PRICE	LEVEL:	Appraisal				
Plant - M	Mechar	nical	FILE:	C:\Documents and Revisions\\Priest F	. Settings\bva Rapids PP_35	notte\Desktop\Black Ro 500 Rev 1.xls Summary	ck\Black Rock				
FY	ЕМ										
PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT				
		Mechanical (cont)	ļ								
				,	1.0		#2 250 050 00				
		Heating, Ventilating, and Air Conditioning	D-8410	1	L.S.		\$2,258,850.00				
		HVAC for building except bus & switchgear									
		372-ft long by 77'-ft wide by 70-ft high unit/service bay	· ·		+						
		54-ft long by 77-ft wide by 20-ft high control bay			 						
		Two each 54-ft long by 77-ft wide by 17-ft equipment rooms	+								
		308-ft long by 56'-ft wide by 20-ft high Electrical Gallery Pump/Motor/Valve Galleries= 756,000 ft^3									
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		Plant - Mechanical Subtotal				DICEO	\$93,929,850.00				
		QUANTITIES	ļ			RICES					
BY		CHECKED	ву С	1		CHECKED	8/10/10/				
	Paul Sch	olein AHR		Cravg A. Grush		Rod	70101				
DATE PRI	EPAREI 4/16/0		DATE PRE	PARED 08/17/04		PEER REVIEW	8/17/04 Ich				

FEATURE: Priest Rapids Intake, Pumping Plant, Switchyard, and		PROJECT: Yakima River Basin Water Storage Options						
		syance System - Q= 3,500 cfs					Орнонь	
			REGION	PN	PRICE	LEVEL:	Appraisal	
Plant-Ele	ectrical		FILE:			bvanotte\Desktop\Bi _3500 Rev 1.xls]Sun	ack Rock\Black Rock nmary	
FN	EM .			• • •				
PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANITTY	UNIT	UNIT PRICE	AMOUNT	
<u> </u>								
		Plant Grounding System (F&I)	D8430					
	1	Ground rods, 10 ft, 3/4" dia., copper-clad		50	EA	\$180.00	\$9,000.0	
		Stranded bare-copper conductor						
	2	250 MCM		1,500	LF	\$5.50	\$8,250.0	
	3	4/0 AWG		1,000	LF	\$4.00	\$4,000.0	
	4	2/0 AWG		1,000	LF	\$3.50	\$3,500.0	
	5	4 AWG		700	LF	\$2.50	\$1,750.0	
		Motor Bus & Switchgear (F&I)	D8430					
	6	Main motor isolated-phase bus:		400	LF	\$5,000.00	\$2,000.000.0	
		15 kV; 24,000 amperes; 3-phase; 60 hz.						
		Self-cooled			ļ			
	ľ			<u></u>				
	7	Individual motor isolated-phase bus:						
		15 kV; 3,500 amperes; 3-phase; 60 hz.		150	LF	\$1,500.00	\$225,000.0	
		Self-cooled						
	8	15 kV; 7,000 amperes; 3-phase; 60 hz.		100	LF	\$2,000.00	\$200,000.0	
		Self-cooled			l			
	·	3411 400140						
		Motor reduced-voltage, static starting system with						
		15 kV, SF6 type unit circuit-breakers						
	9			3	EA	\$240,000	\$720,000.0	
	′ 10	t			EA	\$275,000	\$550,000.0	
	- 10	7,000 amperes commuous current	• • • •	2	12.T.	\$275,000	#	
		· · · •						
		Motor Control Equipment (F&I)	D8430					
	11	Duplex control switchboard for operation of 5 main		1	EA	\$200,000	\$200,000.00	
]	pumping motors.						
L	<u> </u>							
		Motors						
	ļ	Listed under Plant-Mechanical						
	ļ							
		Sheet Subtotal				L	\$3,921,500.00	
		QUANTITIES			P	RICES		
BY	Mike Scl	CHECKED L Rom'	ву С	1 Cor. Elizabeth Tran		СНЕСКЕО	60V 8/17/59	
DATE PRI			DATE PRE			PEER REVIEW	BON 8/17/24	
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Priest F	FEATURE: Priest Rapids Intake, Pumping Plant, Switchyard, and Inflow Conveyance System - Q= 3,500 cfs		PROJECT: Yakima River Basin Water Storage Options					
MHOVV V	DOLLAC	yance System - Q= 3,500 cis	REGION	N PN	PRICE	LEVEL: A	Appraisal	
Plant-Ele	ectrical	1	FILE:	C:\Documents an	nd Settings\b	hvanotte\Desktop\Black _3500 Rev 1.xls]Summa	k Rock\Black Rock	
PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT	
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	<u>—</u>				ļ	+ +		
		15 kV Metal-Clad Switchgear (F&I)	D8430		ļ	+ +		
		2 15 kV Metal-Clad Switchgear (#&t)		} · · · · ;	 EA	\$350,000	\$350,000.00	
ŀ	1,	two 1200 ampere vacuum type power circuit breakers		·	EA	W. Wyww	Φυνυνού	
	<u> </u>	two 1200 ampere vacuum type power eneure orearess						
					Ī			
		15 kV Non-Segregated-Phasac Bus (F&I)	D8430	<u> </u>				
		15 kV, 1200 amperes	Τ	200) FT	\$800.00	\$160,000.00	
	ĺ					<u> </u>		
 	t	Plant Station-Service Equipment (F&I)	D8430		<u> </u>			
,	1	Indoor double-ended secondary unit substation with						
	<u> </u>	following features:	1					
	 14				EA	\$90,000.00	\$180,000.00	
,	15				EA	\$4,500.00	\$150,000.00	
	1	400 v power-eneur breakers, 555 mig-		-	Litt	Ф1,000	West 15	
	1	ţ ··· ··· · · · · · · · · · · · · · · ·	—	<u> </u>				
	[Building Lighting System (F&I)	D8430	····	†——			
	1	Interior luminaires			<u> </u>			
, 1	16			30	EA	\$700.00	\$21,000.00	
, ,	1	THE WAY, THE PROPERTY OF				· · · · · · · · · · · · · · · · · · ·	· · · - · · · · · · · · · · · · · · · ·	
	f				ļ			
	[17	Emergency lighting system	T	l	LS		\$900.00	
	[T					
	18	Exterior luminaires		10	EA	\$400.00	\$4,000.00	
J		High-pressure sodium, wall mounted, outdoor						
]		70 watt, 120 volt		<u> </u>	<u> </u>			
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		Sheet Subtotal		<u> </u>			\$760,900.00	
		QUANTITIES	↓			RICES		
BY	Mike Selv	CHECKED L Romi	BY C	Elizabeth Tran		CHECKED GO√	8/17/04	
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	4/16/04	,	Ĭ	08/17/04	,	1 /	viv	

FEAT	FEATURE:		·	PROJE	PROJECT:						
		s Intake, Pumping yance System - (Plant, Switchyard, and Q= 3,500 cfs		Yakima Rive	er Basin '	Water Storage (Options			
				REGION	PN	PRICE	LEVEL:	Appraisal			
Plant-El	lectrical			FILE:			ovanotte\Desktop\Bla _3500 Rev 1.xls Sum				
 - ½	Ä										
PLANT	PAY ITIM		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT			
	<u> </u>	· · · · · · · · · · · · · · · · ·		-	<u> </u>	·					
	10	Ruilding Fire Datecti	on and Alarm System (F&I)	D8430		LS		\$150,000.00			
	19	bunding Fire Detecti	on and Alarm System (Pax)	- D0430	<u>-</u>						
					:-						
· · · · · · · · · · · · · · · · · · ·	20	Distribution Panelbo		D8430	3	EA	\$80,000.00	\$240,000.00			
		480 volts, 3-phase with	h 400 ampere bus								
	21	Motor Control Cente	rs (F&I)	D8430	2	EA	\$120,000	\$240,000.00			
		480 volts, 3-phase with	h1200 ampere bus			L					
		Five 20 inch wide sect	ions								
	ļ	Insulated Conductor	s (F&I)	D8430	· · · · · · · · · · · · · · · · · · ·						
	<u> </u>	600-volt, single-condu									
	22		· · · · · · · · · · · · · · · · · · ·		12,000	LF	\$0.50	\$6,000.00			
	23	12 AWG			15,000	LF	\$0.55	\$8,250.00			
	24	10 AWG			15,000	LF	\$0.70	\$10,500.00			
	25	6 AWG			3,000	LF	\$1.50	\$4,500.00			
	26	4 AWG			3,000	LF	\$1.75	\$5,250.00			
	27	1/0 AWG			2,000	LF	\$2.75	\$5,500.00			
		600-volt multi-conduc	tor control cable								
	28	•			2,000	I F	\$1.25	\$2,500.00			
	29	[3,000		\$1.50	\$4,500.00			
	30	!	***		3,000		\$1.75	\$5,250.00			
	<u> </u>						·· ·· ·· ·				
		Conduit System (F&		D8430							
		Rigid steel conduit	· · · · · · · · · · · · · · · · · · ·								
	31				800	LF	\$14.00	\$11,200.00			
	32	2 inch		***************************************	500	LF	\$22.00	00.000,11\$			
	33	2 1/2 inch			250	LF	\$30.00	\$7,500.00			
	34	3 inch			250	LF	\$42.00	\$10,500.00			
		Plastic-coated rigid sto									
	35				300	LF	\$30.00	\$9,000.00			
			Plant - Electrical Subtotal				PICES	\$5,413,850.00			
		QL	JANTITIES		 	P	RICES				
BY	Mike Sch	auh	CHECKED L Rom'	ву С	Lelizabeth Tran		CHECKED Bo	s *1:7/04 OED			
DATE PR			PEER REVIEW	DATE PRE			PEER REVIEW	NCD.			
L	4/16/04			1	08/17/04		·/	VEN.			

FEATURE: Priest Rapids Intake, Pumping Plant, Switchyard, and Inflow Conveyance System - Q= 3,500 cfs			PROJE	PROJECT: Yakima River Basin Water Storage Options						
Innow	COUVE	eyance System - Q= 5,500 cis	REGION	PN PRICE LEVEL: Appraisal						
Switchy	ard		FILE:		ck Rock\Black Rock					
PLANT ACCOUNT	РАУ ПЕМ	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRKIE	AMOUNT			
		STRUCTURAL Assume switchyard structures covered under	D8120		<u> </u>					
		unlisted items.		 						
		EL PARMACIA								
		ELECTRICAL								
		Switchyard								
										
		Furnish and Install: Oil-filled, conservator-type power transformer	D8440	3	EA	3,850,000	\$11,550,000.00			
	'	320 MVA; 500-13.8kV, 1-phase			13/1	5,050,000	Ψ11,550,000.00			
	2	500-kV disconnect switches, 1200 amp, 3-phase	D8440	4	EA	125,000	\$500,000.00			
	3	500-kV circuit breakers, 1200 amp, 3-phase	D8440	2	EA	1,115,000	\$2,230,000.00			
							····			
	4	Construct Transmission Line	D8440	6	MILES	1,000,000	\$6,000,000.00			
		Assume 6 miles of transmission line from								
		Midway substation to the east								
	ļ	500-kV, steel towers, 2167 AWG conductor		ļ						
					-					
	_									
					<u> </u>					
		· · · · · · · · · · · · · · · · · · ·								
		Switchyard & Transmission Lin	ne Subtotal	l			\$20,280,000.00			
	<u> </u>	QUANTITIES	2 22 19 101	I	P	RICES	+=0,=00,000,000			
BY L. Gamucie	ello (D844	CHECKED 40)	ву С	For Elizabeth Tran		CHECKED Bo	U 8/17/04			
DATE PR			DATE PRE			PEER REVIEW	DEN 8/17/04			
4/15/2004		James R. Zeiger (D8440)		08/17/04			pen			

	Rapids	Intake, Pumping Plant, Switchyard	, and		r Basin V	Vater Storage O	ptions
	nflow Conveyance System - Q= 3,500 cfs Funnel/Tunnel Option			N PN	PRICE	LEVEL:	Appraisal
		эрноп	REGIO	C:\Documents and	I Settings\b	vanotte\Desktop\Bla	ck Rock\Black Rock
DISCHA				Revisions\ Priest	Rapids PP_	3500 Rev 1.xls]Sum	mary L
PLANT ACCOUNT	PAYITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Construct Tunnel		<u> </u>			
		Construct 34,850-ft long, 17.00-ft finished dia	meter, 20.00-ft minimum bo	re diameter, tun	nel in roc	tk. Tunnel will b	 С
		excavated with TBM and driven uphill. Water					
		32,150-ft long unreinforced concrete lined read Excavation (appr 12 cy/lf)	D-8140	32,150	lf	\$1,700.00	\$54,655,000.00
· · · · · · · · · · · · · · · · · · ·	<u></u>	excavation (appl 12 cyrt)	D-8140	34,130	111	1,700.00	. 434,035,000.00
	2	Furnish and place unreinforced concrete to	unnel lining D-8140	104,000	су	\$350.00	\$36,400,000.00
	3	Cementitious materials for concrete tunne	l lining D-8140	29,300	tons	\$100.00	\$2,930,000.00
	4	Furnish & install 7/8-in dia, 10-ft long roc	k bolts D-8140	228,000	lin ft	\$45.00	\$10,260,000.00
	 	1,000-ft long reinforced concrete lined reach		. . 			
	5	Excavation (appr 12 cy/lf)	D-8140	1,000	lf	\$2,500.00	\$2,500,000.00
	6	Furnish and place reinforced concrete tum	nel lining D-8140	3,230	су	\$350.00	\$1,130,500.00
	7	Cementitious materials for concrete tunne	l lining D-8140	910	tons	\$120.00	\$109,200.00
	8	Furnish and install concrete reinforcement	D-8140	50,400	lbs	\$1.00	\$50,400.00
					<u> </u>		
	2	Furnish and install structural steel tunnel s	supports D-8140	422,000	lbs	\$4.00	\$1,688,000.00
		1,700-ft long steel lined portal reach					
	10	Excavation (appr 12 cy/lf)	D-8140	1,700	lf	\$2,500.00	\$4,250,000.00
	<u> </u>	Steel Tunnel Liner:					
		ASTM A572 Gr. 50; Sy = 50 kpsi St =	= 65 kpsi				
	10a	204" Inside Dia., 3 7/8" wall, L= 1700 ft.	D-8420	14,639,000	LBS	\$2.00	\$29,278,000.00
	11	Furnish and place backfill concrete	D-8140	5,490	су	\$300.00	\$1,647,000.00
	 12	Cementitious materials for backfill concre	te D-8140	1,550	tons	\$130.00	\$201,500.00
	12	Curaigh P. install 7/9 in dia 10 St language	k bolts D-8140	8,400	lin fr	\$55.00	 \$462,000.00
	13	Furnish & install 7/8-in dia, 10-ft long roc	K Dolls D-8140	8,400	lin ft	\$55.00	.p+02,000.00
	14	Furnish and install structural steel tunnel s	supports D-8140	422,000	Ibs	\$4.00	\$1,688,000.00
		Sheet Subtotal		· · ·			\$147,249,600.00
		QUANTITIES			Pi	RICES	
BY		npson (D8140)	8140) BY (Torig A. Grush		CHECKED 60	J 8/17/04
Rick Frisz (D8420) DATE PREPARED 4/19/04 PEER REVIEW		PEER REVIEW	DATE PR	EPARED 08/17/04		PEER REVIEW	pex

FEATU	JRE:		PROJE	PROJECT:					
Priest F	iest Rapids Intake, Pumping Plant, Switchyard, and flow Conveyance System - Q= 3,500 cfs			Yakima River	Basin W	ater Storage C)ptions		
Tunnel/1			REGION	PN	PRICE	LEVEL:	Appraisal		
DISCHA				C:\Documents and Revisions\ Priest F			ick Rock\Black Rock imary		
L K	EM								
PLANT ACCOUNT	PAYITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
		Construct Surge Shaft		-					
_		Construct 1506-ft dccp, 22.0-ft finished diameter, 24.34-ft mini	imum bore d	iameter, shaft in	rock. S	haft will be			
		excavated by raise bore and drill down method. Water problem	ns will be mi	nimal. Shaft ba	s two fin	al support reach	es.		
		1,200-ft deep unreinforced concrete lined reach							
	15		D-8140	1,200	lf	\$6,000.00	\$7,200,000.00		
· - 	16	Furnish and place unreinforced concrete shaft lining	D-8140	3,800	cy	\$350.00	\$1,330,000.00		
	17	Cementitious materials for concrete shaft lining	D-8140	1,070	tons	\$130.00	\$139,100.00		
	18	Furnish & install 5/8-in dia, 6-ft long rock bolts	D-8140	63,100	lin (t	\$50.00	\$3,155,000.00		
-		300-ft long reinforced concrete lined shaft top reach							
	19	Excavation (appr 17 cy/lf)	D-8140	300	lf	\$6,000.00	\$1,800,000.00		
	20	Furnish and place reinforced concrete shaft lining	D-8140	945	су	\$400.00	\$378,000.00		
	21	Cementitious materials for concrete shaft lining	D-8140	265	tons	\$160.00	\$42,400.00		
	. 22	Furnish and install concrete reinforcement	D-8140	15,700	lbs_	\$1.00	\$15,700.00		
	23	Furnish & install 5/8-in dia, 6-ft long rock bolts	D-8140	15,600	lin ft	\$50.00	\$780,000.00		
	24	Furnish and install chain link protection	D-8140	13,000	sq yd	S20.00	\$260,000.00		
-									
	ļ								
		Sheet Subtotal					\$15,100,200.00		
		QUANTITIES			PF	RICES			
BY	Bill The	CHECKED ZA	BY (Cylig A. Grush		снескер В д	J 8/17/04		
DATE PR	EPAREI:		DATE PRE	EPARED 08/17/04		PEER REVIEW	DED 8/17/04		

	Rapids	s Intake, Pumping Plant, Switchyard, and	PROJE	CT: Yakima River	: Basin W	ater Storage C	Options
Inflow (<i>Tunnel/</i> 1		eyance System - Q= 3,500 cfs	REGION	PN	PRICE I	EVEL:	Appraisal
Tunner	:Unner (Option	FILE:		•		
DISCHA	RGE1		(C:\Documents and Revisions\ Priest R			ack Rock\Black Rock mary
PLANT ACCOUNT	PAYITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
				· 			
	H	Tunnel Outlet Features		<u></u>]			
		Assume ~100' head to valley invert and L~ 4000' Assume need to control flow from tunnel portal to					
		bottom of reservoir during initial fill.	1				
	<u> </u>	Earthwork	1				+
	25	Excavation at outlet area for portal and channel	D8130	50,000	CY	\$15.00	
!	1 1	Excavation for pipe trench	D8130	307,000	CY	\$5.00	\$1,535,000.00
	27	Excavation for thrust block	D8130	1,500	CY	\$15.00	\$22,500.00
	28	Concrete for open channel	D8130	500	CY	\$400.00	\$200,000.00
	+	P & P reinforcement (160 lbs/CY)	D8130	83,000	LBS	\$1.00	1 ' '
	-	Furnish and handle cement (.282T/CY)	D8130	150	TONS	\$160.00	\$24,000.00
	1		1				
	I	Concrete for thrust block	D8130	1,000	CY	\$400.00	\$400,000.00
	·	F & P reinforcement (100 lbs/CY)	D8130	100,000	LBS	\$1.00	\$100,000.00
	331	Furnish and handle cement (.235T/CY)	D8130	240	TONS	\$160.00	\$38,400.00
	34	Furnish and place Zone 3 bedding for pipe	D8130	24,000	CY	\$40.00	\$960,000.00
	}	Backfill pipe with excavated material	D8130	237,000	CY	\$7.00	\$1,659,000.00
	1	Furnish and place zone 3 bedding for riprap	D8130	5,000	CY	\$40.00	\$200,000.00
	h	Furnish and place riprap	D8130	10,000	CY	\$35.00	\$350,000.00
	38	20 ' dia. Steel pipe L = 4000' t= 3/4 inches	D8130	8,500,000	LBS	\$2.00	\$17,000,000.00
	 	Wt/ft + 10% for couplings and connections		!	<u></u>		
	39	Steel safety trashracks	D8410	80,000	LBS	\$4.00	\$320,000.00
	40	Steel Bulkhead	D8410	120,000	LBS	\$4.00	\$480,000.00
	41	Remove and salvage 20' dia. Steel pipe	D8410	7,650,000	LBS	N/A	N/A
	l	Assume diver-assisted removal in wet at a max	\perp				<u> </u>
		depth = 100'. Assume removal of 90% of the pipe.					· · · · · · · · · · · · · · · · · · ·
	ļ!	Assume lift bags to raise pipe and barge-mounted			<u> </u>		
		crane to handle pipe at surface.			ļŢ		
	'	Salvage at \$50/ton (quote), but salvage value is	T				
	 '	much less than the cost to remove and cut up pipe.				!	
		Discharge 1 - Subtotal	+		\vdash		\$186,471,700.00
	<u></u>	QUANTITIES	+		PR	ICES	w,,
вү		anton (D8130) CHECKED Arristensen (D8410) Amp	ву С	Craig A. Grush	F	CHECKED	501 8/17/04
DATE PRI		D PEER REVIEW	DATE PREP	-]	PEER REVIEW	DED

Priest Rapids Intake, Pumping Plant, Switchyard, and			PROJECT: Yakima River Basin Water Storage Options						
		eyance System - Q= 3,500 cfs	REGION	PN	IBBICK	LEVEL:	Approisal		
Tunnei/.	Pipeline	Option	FILE.				Appraisal		
DISCHA	ARGE2					yanotte\Desktop\B1 3500 Rev 1.xls]Sun	ack Rock\Black Rock nmary		
PLANT ACCOUNT	PAYIIEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
		Construct Lower Tunnel	.						
		Construct 3,150-ft long, 16.00-ft finished diameter, 19.00-ft min							
	ļ	Tunnel will be excavated with TBM driven uphill (D&B also like	cely). Water	r problems wil	l be minii	mal.			
	-	Tunnel has two final support reaches.							
		1,450-ft long unreinforced concrete lined reach							
	1	Excavation (appr 10.5 cy/lf)	D-8140	1,450	l. If	\$2,000.00	\$2,900,000.00		
		Excavation (appr 10.3 cy/11)	D-8140	1,430	1	\$2,000.00	\$2,700,000.00		
	2	Furnish and place unreinforced concrete tunnel lining	D-8140	4,430	су	\$350.00	\$1,550,500.00		
	3	Cementitious materials for concrete tunnel lining	D-8140	1,250	lons	\$130.00	\$162,500.00		
	4	Furnish & install 3/4-in dia, 8-ft long rock bolts	D-8140	8,520	lin ft	\$55.00	\$468,600.00		
						<u> </u>			
		1,700-ft long steel lined portal reach							
	5		D-8140	1,700	lf	\$2,000.00	\$3,400,000.00		
		Steel Tunnel Liner:			ļ				
		ASTM A572 Gr. 50: Sy = 50 kpsi St = 65 kpsi							
	5a	192" Inside Dia., 3 5/8" wall, L= 1,700 ft.	D-8420	12,890,000	LBS	\$2.00	\$25,780,000.00		
	†			•					
	6	Furnish and place backfill concrete	D-8140	5,190	су	\$300.00	\$1,557,000.00		
	7	Cementitious materials for backfill concrete	D-8140	1,460	tons	\$130.00	\$189,800.00		
						0.55.00			
	8	Furnish & install 3/4-in dia, 8-ft long rock bolts	D-8140	9,800	lin ft	\$55.00	\$539,000.00		
<u> </u>	9	Furnish and install structural steel tunnel supports	D-8140	400,000	lbs	\$4.00	\$1,600,000.00		
					ļ				
				·					
		. · · · · · · · · · · · · · · · · · · ·							
		Sheet Subtotal					\$38,147,400.00		
		QUANTITIES			PI	RICES	Ψυσ,×+1,400.00		
BY	Bill Ther	npson (D8140) CHECKED 4/4	BY C	1		T	1 . 1		
		ız (D8420)		Faig A. Grush			SOV 3/17/04		
DATE PR			DATE PREI			PEER REVIEW	pert		
	4/19/04			08/17/04			per		

FEATURE:			PROJECT: Yakima River Basin Water Storage Options						
		s Intake, Pumping Plant, Switchyard, and eyance System - Q= 3,500 cfs		Yakima Kivei	î Basin v	Vater Storage O	ptions		
		e Option	REGION	l PN	PRICE	LEVEL:	Appraisal		
DISCHA	ARGE2					vanotte\Desktop\Bla 3500 Rev 1.xls Sum	ick Rock\Black Rock		
PLANT	PAYITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
		Construct Upper Tunnel							
		Construct 11,300-ft long, 21.00-ft finished diameter, 23.67-ft mi excavated with TBM and driven uphill. Water problems will be					е 		
	<u> </u>	excavated with 1 Divi and driven aprille 17 and problems with the		Tumer nas one	Ima sor	Joir reacii.			
		11,300-ft long unreinforced concrete lined reach	<u> </u>			· · · · · · · · · · · · · · · · · · ·			
	10		D-8140	11,300	lf	\$2,500.00	\$28,250,000.00		
	11	Furnish and place unreinforced concrete tunnel lining	D-8140	39,200	су	\$350.00	\$13,720,000.00		
	12	Cementitious materials for concrete tunnel lining	D-8140	11,000	tons	\$110.00	\$1,210,000.00		
	13		D-8140	86,820	lin ft	\$50.00	\$4,341,000.00		
	14	Furnish and install structural steel tunnel supports	D-8140	619,000	lbs	\$4.00	\$2,476,000.00		
		Construct Surge Shaft							
	 	Construct 1,380-ft deep, 16.0-ft finished diameter, 18.00-ft minii							
	ļ	excavated by raise bore and drill down method. Water problems	s will be mi	nimal. Shaft ha	as two fin	al support reach	es.		
			. /						
	ļ	1,080-ft deep unreinforced concrete lined reach	<u> </u>		ļ				
	15	· · · · · · · · · · · · · · · · · · ·	D-8140	1,080		\$4,000.00	\$4,320,000.00		
	16		D-8140	2,130		\$350.00	\$745,500.00		
	17		D-8140	600	tons	\$140.00	\$84,000.00		
	18	Furnish & instalt 5/8-in dia, 6-ft long rock bolts	D-8140	38,900	lin ft	\$50.00	\$1,945,000.00		
		300-ft long reinforced concrete lined shaft top reach	· ·						
	1e	***************************************	D 8140	300	1f	\$4,000.00	\$1,200,000.00		
	19		D-8140	300 502					
	20		D-8140	592	tons	\$400.00	\$236,800.00		
	21		D-8140	11.500	tons	\$160.00	\$26,720.00		
	22	·	D-8140	11,500	lbs lin ft	\$1.00 \$50.00	\$11,500.00		
	23	Furnish & install 5/8-in dia, 6-ft long rock bolts	D-8140	10,800	lin ft	\$.50.00	\$540,000.00		
	24	Furnish and install chain link protection	D-8140	8,830	sq yd	\$20.00	\$176,600.00		
			-						
	ļ								
		Sheet Subtotal			<u></u> '		\$59,283,120.00		
		QUANTITIES	<u> </u>		PF	RICES			
BY	1	CHECKED KA	BY C	Taig A. Grush		CHECKED BO	1 3/17/0h		
DATE PR	EPARED	PEER REVIEW	DATE PRE	PARED 08/17/04		PEER REVIEW			

FEAT	JRE:		PROJECT:					
Priest Rapids Intake, Pumping Plant, Switchyard, and Inflow Conveyance System - Q= 3,500 cfs					r Basin V	Vater Storage (Options	
		Option	REGION	PN	PRICE	LEVEL:	Appraisal	
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μĘ	ME							
PLANT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT	
			<u></u>					
		Construct Pipeline	D8140					
			<u> </u>		<u></u>		}	
		Excavation for line pipe trenches	70140	1.710.000			#12.100.00P.0	
	25	Rock Excavation (90%)	D8140	1,710,000	CY	\$10.00	\$17,100,000.0	
	26	Common Excavation (10%)	D8140	190,000	CY	\$5.00	\$950,000.0	
	27	Backfill for line pipe trenches	D8140	1,116,000	CY	\$7.00	\$7,812,000.00	
		Backini for this pipe denotes	156140	1,110,000	<u> </u>	\$7.00	Φ1,812,000.08	
	28	Soil cement slurry for line pipe trenches	D8140	428,000	CY	\$55.00	\$23,540,000.00	
· 								
		Furnishing and installing steel line pipe in the						
		following sizes:					· · · · · · · · · · · · · · · · · · ·	
	 29	18 ft diameter, t=1 inch, weight (lbs) per foot	D8140	26,110	LF	\$4,600.00	\$120,106,000.00	
		2309						
	30	17 ft diameter, t= 1 inch, weight (lbs) per foot	D8140	5,000	LF	\$4,400.00	\$22,000,000.00	
	ļ	2181						
	31		D8140	7,940	LF	\$5,700.00	\$45,258,000.00	
		2835						
	ļ							
		Sheet Subtotal				RICES	\$236,766,000.00	
QUANTITIES				Pł				
BY	Linda Bo		BY ()	Craig A. Grush		CHECKED	80V B/17/04	
DATE PR	EPARED 4/19/04	PEER REVIEW	DATE PRE	PARED 08/17/04		PEER REVIEW	OED	

FEATURE: Priest Rapids Intake, Pumping Plant, Switchyard, and			PROJECT: Yakima River Basin Water Storage Options						
		s Intake, Pumping Plant, Switchyard, and eyance System - Q= 3,500 cfs		Yakima River	Basin V	Vater Storage (Options		
		e Option	REGION	PN	PRICE	LEVEL:	Appraisal		
DISCHA			FILE:		SettingsVb		nck Rock\Black Rock		
뉴 보	W.								
PLANT ACCOUNT	P.A.Y. ITISM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
	ļ	Inflow Pipe Outlet Features	 			· 			
		Assume ~100' head to valley invert and L~ 4000'	···						
	<u> </u>	Assume need to control flow from tunnel portal to							
		bottom of reservoir during initial fill.							
	·	Earthwork							
	32	Excavation at outlet area for portal and channel	D8130	50,000	CY	\$15.00	\$750,000.00		
		Excavation for pipe trench	D8130	307,000	CY	\$5.00	\$1,535,000.00		
		Excavation for thrust block	D8130	1,500	CY	\$15.00	\$22,500.00		
	<u>-</u> -' •			-,,,,,,,,			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
	35	Concrete for open channel	108130	500	CY	\$400.00	\$200,000.00		
		F & P reinforcement (160 lbs/CY)	D8130	83,000	LBS	\$1.00	\$83,000.00		
		Furnish and handle cement (.282T/CY)	D8130	150	TONS	\$160.00	\$24,000.00		
	38	Concrete for thrust block	D8130	1,000	CY	\$400.00	\$400,000.00		
	39	F & P reinforcement (100 lbs/CY)	D8130	100,000	LBS	\$1.00	\$100,000.00		
	40	Furnish and handle cement (.235T/CY)	D8130	240	TONS	\$160.00	\$38,400.00		
	41	Furnish and place Zone 3 bedding for pipe	D8130	24,000	CY	\$40.00	\$960,000.00		
	42	Backfill pipe with excavated material	D8130	237,000	CY	\$7.00	\$1,659,000.00		
	43	Furnish and place zone 3 bedding for riprap	D8130	5,000	CY	\$40.00	\$200,000.00		
	44	Furnish and place riprap		10,000	CY	\$35.00	\$350,000.00		
	<u> </u>		ļ		. ,				
	45	20 ' dia. Steel pipe L = 4000' t= 3/4 inches	D8130	8,500,000	LBS	\$2.00	\$17,000,000.00		
··· ·		Wt/ft + 10% for couplings and connections							
	46	Steel safety trashracks	D8410		LBS	\$4.00	\$320,000.00		
	_								
			-						
<u></u>									
<u> </u>	†				•				
<u> </u>		Di La Galeet					#### PTO 440 00		
		Discharge 2 - Subtotal Olivery QUANTITIES			DE	RICES	\$357,838,420.00		
		1/ D							
ВҰ		istensen (D8410) CHECKED AND	ву (Craig A. Grush		CHECKED Bo	N 3/17/04 ACA		
DATE PR	EPARED	PEER REVIEW	DATE PRE	PARED		PEER REVIEW	000		
	4/27/04		08/17/04				per		

Priest Rapids Intake, Pumping Plant, Switchyard and Inflow Conveyance System Q= 6,000 cfs

Field Cost Estimate

FEATURE:			PROJECT: Yakima River Basin Water Storage Options						
		s Intake, Pump/Generating Plant, and Conveyance System To/From BRR		Yakima Rive	er Basin V	Vater Storage (Options		
		ate Conveyance System - Q= 3,500 cfs	REGION	PN PRICE LEVEL: Appraisal					
Summar			FILE:		and Settings\bvanotte\Desktop\Black Rock\Black Rock st Rapids PumpGen_3500 Rev 1.xls Summary				
FX	EM								
PLANT	РАҮ ІТЕМ	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
		Estimate Worksheets Identify one Inlet and one Outlet to Pri	est Rapids	\					
		one Pump/Generating Plant, one Discharge/Penstock to BRR		<u> </u>					
		and one Multi-Level Intake at BRR.							
		Discharge 1: Tunnel/Tunnel Inflow Line to BRR							
			_	ļ 					
	:	PUMP-GENERATING PLANT PLUS DISCHARGE 1: TU	l NNEL/TU	I NNEL					
		Inlet/Outlet - Civil/Structural Subtotal					\$54,437,850.00		
		Inlet/Outlet - Mechanical/Electrical Subtotal					\$10,113,270.00		
		PG - Civil/Structural Subtotal					\$75,889,950.00		
		PG - Mechanical Subtotal					\$116,806,730.00		
		PG - Electrical Subtotal					\$13,278,200.00		
		Switchyard & Transmission Line Subtotal					\$20,280,000.00		
· ·	<u> </u>	Discharge 1 - Subtotal					\$272,037,100.00		
		Subtotal					\$562,843,100.00		
		Mobilization +/-	5%				\$28,000,000.00		
		Subtotal w/ mobilization					\$590,843,100.00		
		Unlisted Items +/-	10%				\$59,156,900.00		
		CONTRACT COST					\$650,000,000.00		
		Continuonaisa	25%				\$160,000,000.00		
		Contingencies +/-	23%				\$160,000,000.00		
		FIELD COST					\$810,000,000.00		
<u> </u>	 								
QUANTITIES		QUANTITIES			PI	RICES			
вү		CHECKED	BY	Craig Grush Elizabeth Tran		CHECKED	V 8/17/04		
DATE PREPARED PEER REVIEW		PEER REVIEW	DATE PREPARED 08/17/04 PEER REVIEW 08/17/04				CD 8/17/04		

FEATU Priest I	Rapids	s Intake, Pump/Generating Plant,	PROJECT: Yakima River Basin Water Storage Options						
Switch; Bump#	yard a Gonor	and Conveyance System To/From BRR rate Conveyance System - Q= 3,500 cfs	REGION	PN	PRICE	LEVEL:	Appraisal		
inlet/Out			FILE:	C:\Documents ar	nd Settings\b		lack Rock\Black Rock		
PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
		CIVIL							
		Construct/Remove Cellular Cofferdam around Reservoir In	ntake						
		Assume construct from shore without barge.							
		Assume circular cellular cofferdam.		<u> </u>					
		Length= 380 feet, 32-ft dia. cells, 28 ft high							
		Top of cofferdam - El. 488, Bottom of cofferdam - El.	460						
		Assume top of rock at reservoir bottom							
·	1	Furnish and install sheet pile walls Arbed AS 500-12, 30 psf	D8120	555	TONS	\$2,200.00	\$1,221,000.0		
		Backfill cells with free-draining granular material	D8120	11,700	CY	\$30.00	\$351,000.00		
		Dickini cens with the Graning granata material							
	3	Unwater behind cofferdam	D8120	6	MOS	\$55,000.00	\$330,000.0		
		Assume sumps and surface pumps							
	l								
	l								
	<u> </u>	Remove Cofferdam		· . · · · · · · · · · · · · · · · · · ·					
		Remove and stockpile granular material	D8120	11,700	CY	\$25.00	\$292,500.00		
	6	Extract and salvage sheet pile cutoff wall	D8120	555	TONS	\$300.00	\$166,500.00		
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	<u> </u>								
	ļ ···								
	·								
		Sheet Subtotal		<u> </u>	<u></u>	DIOCC.	\$2,361,000.00		
		QUANTITIES	-,		Р	RICES			
BY	Dick Lal	Fond CHECKED MRC Shee	BY J	Craig Grush		CHECKED Bov/	8/17/04		
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	4/19/04	;		08/17/04		/	レールー		

FEATL			PROJE					
		s Intake, Pump/Generating Plant,	1	Yakima Rive	er Basin '	Water Storage	Options	
		and Conveyance System To/From BRR rate Conveyance System - Q= 3,500 cfs	REGION	PN	PRICE	LEVEL:	Appraisal	
r ump/	Gener	ate Conveyance System - Q= 0,000 013	FILE.					
Inlet/Out	tlet- Str	ructural	l .			ovanotte\Desktop\B1 npGen_3500 Rev 1.	ack Rock\Black Rock xls Summary	
F	EM							
PLANT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT	
		Structural Excavation and Backfill			<u></u>			
		Assume dam excavation is all common.	<u></u>					
		Assume top 5 feet of excavation is common and the remained	ler is rock		ļ			
		Assume stockpile and use for backfill or embankment.						
	7	Excavation of common materials for structures	D8140	432,900	CY	\$6.00	\$2,597,400.0	
_	8	Excavation of rock for structures (drill & shoot)	D8140	717,000	CY	\$15.00	\$10,755,000.00	
	9	Furnish backfill for structures (assume local borrow)	D8140	70,800	CY	\$4.00	\$283,200.00	
	10	Place backfill around structures	D8140	70,800	CY	Included above	:	
	11	Compact backfill around structures	D8140	70,800	CY	\$5.00	\$354,000.00	
		Roads and Fencing						
	12	Gravel surfacing		2,680	TONS	\$20.00	\$53,600.00	
ľ		20 ft wide road right side of channel			}			
		12 ft wide road left side of channel						
		2 -20 ft wide road both sides of tailrace channel						
	13	Safety fencing		5,500	LF	\$20.00	\$110,000.00	
		8' chainlink fence						
	 	STRUCTURAL						
			- ·				-	
		Construct Gated Intake, Fishscreen Structure, and Tailrace	Channel					
	14	Furnish, form, and place reinforced concrete (f'c=4ksi)	D8140	50,220	CY	\$350.00	\$17,577,000.00	
	· ·	Furnish and place concrete reinforcement.	D8140	8,035,000	LBS	\$0.75	\$6,026,250.00	
	} ··	Furnish and handle cement	D8140	14,160	TONS	\$110.00	\$1,557,600.00	
	<u> </u>	1 Gillian Bald Hallelo Collicia	1 20170	11,700	1 2 1 1 2			
	1	Construct Lined Intake Canal				-		
	17	Furnish, form, and place unreinforced concrete	D8140	2,350	CY	\$350.00	\$822,500.00	
<u> </u>		lining in excavated channel (fc= 3 ksi)	20140	2,550		φ.σ.σ.σ.σ	5022,500.00	
	1.0	Furnish and handle cement	D8140	665	TONS	\$140.00	\$93,100.00	
	1.0	Turinsh and handle cernell	D5140		10115	Ψ1-0.00	\$75,100.00	
	 	Construct Bypass Pipe	-					
	1 .	3 - 54" Dia. steel pipe for fish bypass.		15,840	LF	\$330.00	\$5,227,200.00	
	1.7	Mortar line pipes		1.7,040		\$550.00	\$5,221,200.00	
	20	Bypass pipe common excavation		270,000	CY	\$5.00	\$1,350,000.00	
	+	Bypass pipe continuor excavation	 	130,000	CY	\$15.00	\$1,950,000.00	
<u> </u>			1		t	1	\$2,660,000.00	
	· .	Bypass pipe backfill		380,000	CY	\$7.00		
	2.5	Bypass pipe soil cement bedding (100 psi)	l	12,000	CY	\$55.00	\$660,000.00	
}	-	144						
 	 	Miscellaneous Metalwork						
<u> </u>	 	Listed under Intake - Mechanical Items			 		AEA 427 PED DO	
		Inlet/Outlet - Civil/Structural Subtotal			<u> </u>	RICES	\$54,437,850.00	
<u> </u>		QUANTITIES			r			
BY	Chou Ch	CHECKED David Gesundheit/Anne Pavol	BY J	Craig Grush		CHECKED BO√	8/17/04	
DATE PR	EPARED	PEER REVIEW	DATE PREI	PARED		PEER REVIEW	200	
DATE PREPARED 4/19/04			08/17/04			BOV 8/17/04 PEER REVIEW ACA		

FEATURE:			PROJECT:						
Priest	Rapid:	s Intake, Pump/Generating Plant, and Conveyance System To/From BRR			er Basin	Water Storage	Options		
Pump.	Gener	ate Conveyance System - Q= 3,500 cfs	REGION	PN	PRICE	LEVEL:	Appraisal		
Inlet/Ou	ıtlet- Me	echanical	FILE:			ovanotte\Desktop\BI npGen_3500 Rev 1.	ack Rock\Black Rock xls]Summary		
F K	EM								
PLANT	PAYITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
		Mechanical							
	<u> </u>	Pump Intake Channel	-				ļ .		
	1 :		DRAIG	12 500		\$6.00	\$91,000,00		
	<u> </u>	Furnish and install steel stoplog guides and seats (upstream of radial gates)	D8410	13,500	LBS	\$6.00	\$81,000.00		
	2	Furnish and install steel trashracks	D8410	102,000	LBS	\$4.00	\$408,000.00		
	3	Furnish and install one trash rake, rails, supports	D8410	21,000	LBS	\$10.00	\$210,000.00		
		(assume Atlas Polar DT8300 rake)			ļ				
	·				<u></u>				
	. 4	Furnish and install one conveyor, steel	D8410	13,000	LBS	\$10.00	\$130,000.00		
	5	Furnish and install steel fish screen guides, supports,	D8410	360,000	LBS	\$4.00	\$1,440,000.00		
		embedded seats, and bypass walls							
L	6	Furnish and install fish screens, 10' W x 14' H panel	D8410						
		70 panels + 6 spares	.		1.00	* 4.00	#405 600 00		
		Structural steel Stainless steel		106,400 106,400	LBS	\$4.00 \$15.00	\$425,600.00 \$1,596,000.00		
		Statilless steet		100,400	1300	\$15.00	\$1,590,000.00		
	7	Furnish and install barrier panels above fish screens	D8410						
		10' W x 11' H panels, 70 panels + 6 spares							
		Structural steel		209,000	LBS	\$4.00	\$836,000.00		
			Datio						
	8	Furnish and install adjustable baffle panels 10' W x 25' H panels, 70 panels + 6 spares	D8410						
<u></u>		Structural steel		570,000	LBS	\$4.00	\$2,280,000.00		
	9	Furnish and install fish screen cleaners with travel rail,	D8410						
		5 systems with 2 brush cleaner arms per system			<u> </u>				
	-	a. Structural steel b. Stainless steel		40,000 2,500	LBS	\$4.00 \$20.00	00.000,001\$ 00.000,00\$		
	ļ	c. 2 Hp motors/gear reducers, with adj. speed		2,300	UNITS	\$5,000.00	\$25,000.00		
		controllers, and limit switches	·			45,355			
	10	Furnish and install water level measuring systems	D8410	12	UNITS	\$11,000.00	\$132,000.00		
	<u> </u>								
<u> </u>		Sheet Subtotal					\$7,773,600.00		
QUANTITIES				Р	RICES				
BY		CHECKED	вч _	1		CHECKED	1 0/10/1		
		ensen/B Sund		Craig Grush		010	8/1/04		
	REPARED	PEER REVIEW	DATE PRE			CHECKED BOT PEER REVIEW	OCL		
5/24/2004				08/17/04		/	V - /V -		

FEATURE: Priest Rapids Intake, Pump/Generating Plant, Switchyard and Conveyance System To/From BRR			PROJECT: Yakima River Basin Water Storage Options							
	-	•	System + 0/From BHH E System - Q= 3,500 cfs	REGION	N PN PRICE LEVEL: Appraisal					
•		echanical	. Gystom - Q= 0,500 die	FILE:						
PLANT	PAY ITEM	Andreas de la companya de la company	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT.		
· · · 		Mechanical - Pump	Intake Channel (cont)							
	11	Furnish and install s	teel stoplog guides and seats screens)	D8410	13,500	LBS	\$6.00	\$81,000.0		
	12	Furnish and install o	nc set of steel stoplogs for the two ith lifting beam	D8410	101,000	LBS	\$4.00	\$404,000.0		
	13	3' wide walkway, sto	el, safety grating alng fish screens	D8410	19,500	LBS	\$7.00	\$136,500.0		
	14	Handrail along each	side of fish screen walkway	D8410	1,520	LF	\$50.00	\$76,000.0		
		Radial Gates in Int	ake Structure	 						
		Furnish and install to radial gates and hois	wo 36.5-ft x 8.5-ft top scal t equipment:	D8420						
	16		k (Weight/bay= 5,000 lbs)			LBS LBS	\$8.00 \$5.00	\$552,960.0 \$50,000.0		
			oist operator (Weight/gate operator= 11,300 lbs) Iotor - 5 hp (One per gate)		22,600		\$20.00 Included in oper	\$452,000.0 rator		
		Furnish and install o	ne 15.0-ft x 8.5-ft top seal	D8420						
		radial gate and hoist Gate (Weight/gate=	20,790 lbs)		20,790		\$8.00	\$166,320.0		
	21		k (Weight/bay= 3,000 lbs) ght/gate operator= 6,150 lbs)		3,000 6,150		\$5.00 \$20.00 Included in open	\$15,000.0 \$123,000.0		
							meraded in oper			
		Mechanical - Turbi	ne Tailrace Channel							
	23	Furnish and install s	eel stoplog guides and seats	D8410	8,500	LBS	\$5.00	\$42,500.0		
	24	Furnish and install tr	ashrack (steel)	D-8410	36,000	LBS	\$4.00	\$144,000.00		
	<u> </u>									
			Sheet Subtotal					\$2,243,280.00		
		Q	UANTITIES			P	RICES			
BY		ensen/B Sund (D8410) an (D8420)	CHECKED AME	ву С	Craig Grush		CHECKED Bov	8/17/04		
DATE PREPARED 5/24/2004			PEER REVIEW	DATE PRE	PARED 08/17/04		PEER REVIEW DEAL			

FEATURE: Priest Rapids Intake, Pump/Generating Plant,		PROJECT: Yakima River Basin Water Storage Options								
Switchyard and Conveyance System To/From BRR Pump/Generate Conveyance System - Q= 3,500 cfs										
Pump/	/Gener	ate Conveyance S	System - Q= 3,500 cfs	REGION	PN	PRICE	LEVEL:	Appraisal		
Inlet/Outlet- Electrical		FILE:		and Settings\bvanotte\Desktop\Black Rock\B st Rapids PumpGen_3500 Rev 1.xls Summar						
F. F.N.I	ŒМ									
PLANT	PAY ITEM		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
					•	ļ				
		ELECTRICAL	_			<u> </u>				
		C				<u> </u>		1		
ŀ		Service Equipment (I		D8430	1		\$25,000,00	\$25,000.0		
		Distribution panelboar			<u> </u>	ĖΑ	\$25,000.00	\$25,000.0		
		480 voits, 3-pnase	with 225 ampere bus							
	26	Outdoor transformer lo	and center		1	EA	\$11,000.00	0.000,11\$		
		15 kVA, I-phase.				7				
		Combination Motor S	Starters	D8430						
	27	NEMA size 2 non-revo	ersing contactor,		6	EA	\$8,000.00	\$48,000.0		
		480-120 volt centrol tr	ansformer							
		NEMA type 4 enclosu	ге							
		Insulated Conductors	(F&I)							
		600-volt, single-condu	ctor, stranded copper							
	28	12 AWG			500	LF	\$0.60	\$300.0		
	29	10 AWG			200	LF	\$0.70	\$140.0		
	30	8 AWG			100	LF	\$1.00	\$100.0		
						ļ				
		Conduit System (F&I	<u>) </u>							
	ļ	Rigid steel conduit			150	-	#15.00	#2.550.0		
	31	l inch			150	I.F.	\$15.00	\$2,250.00		
	-					f	- 			
								· ·		
· · · · · · · · · · · · · · · · · · ·		Lighting System (F&		D8430		}				
	32		ium, pole mounted, outdoor	1 20,120	6	EA	\$1,600.00	\$9,600.00		
		70 watt, 120 volt	Total Treatment, control				4.,400.00			
]			
						<u> </u>				
							<u> </u>			
			Inlet/Outlet - Mechanical/Electrical/Electrical	al Subtotal			RICES	\$10,113,270.00		
						<u> </u>				
BY	Mike Scl	ոսի	CHECKED L Rom'	BY J	for: Élizabeth Tran		CHECKED BOV	8/17/04		
DATE PR	EPARED		PEER REVIEW	DATE PREI			PEER REVIEW	0 - 0		
	4/16/04			ĺ	08/17/04			BOV 8/17/24 PEER REVIEW DCD		

FEATURE: Priest Rapids Intake, Pump/Generating Plant,			PHOJECT: Yakima River Basin Water Storage Options						
Switch	yard a	nd Conveyance S	iystem To/From BRR		I Middle 10 (C.		Br 2 6430112		
Pump/	Gener	ate Conveyance S	System - Q= 3,500 cfs	REGION	PN	PRICE	LEVEL:	Appraisal	
PG - Civ	ril						anotte\Desktop\Black Gen_3500 Rev 1.xl	ck Rock\Black Rock s Summary	
PLANT ACCOUNT	PAY ITEM		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT	
			les of 2-lane access road):			<u> </u>	<u></u>		
		Assume construct	access road from SH24 to PP.			· · · ·			
			I along abandoned railroad alignment	ļ <u> </u>		ļ			
		Assume no major	excavation or embankment sections.			<u> </u>			
	1 1	Clear roadway alignmo	ent	D8140	45	AC_	\$3,500.00	\$157,500.00	
	2	Furnish and place base	course material (9-inch depth)	D8140	96,000	TONS	\$16.00	\$1,536,000.00	
	3	Furnish and place asph	alt concrete (6-inch depth)	D8140	70,000	TONS	\$60.00	\$4,200,000.00	
	"-			[[.					
	4	Furnish and install W-	beam type guardrail	D8140	10,000	LF	\$25.00	\$250,000.00	
<u> </u>	<u>:</u>			D0140	1.000	1.5	\$200.00	#200 000 00	
	<u> </u>		cellaneous pipe culverts	D8140	1,000	LF	\$200.00	\$200,000.00	
ļ ——		Assume 36-inch-c	liameter, wt/ft= 35#/ft)	-		l			
		Service Yard (6" aspl	halt concrete surface)						
	6	 	g plant site to 1 foot depth	D8120	16,200	CY	\$3.00	\$48,600.00	
	! —	*	Service Yard El. 505.0	D8120	180,000	CY	\$5.00	\$900,000.00	
		Rock excavation to Se		D8120	220,000	CY	\$15.00	\$3,300,000.00	
	 		bankment for service yard	D8120	19,200	CY	\$8.00	\$153,600.00	
i.			course material (6-inch)	D8120	11,000	TONS	\$20.00	\$220,000.00	
	 	Furnish and place asph		D8120	12,000	TONS	\$80.00	\$960,000.00	
		·	oot chain link fence for PP Yard	D8120	3,200	LF	\$20.00	\$64,000.00	
	l	· - · - · - · - · - · - · - · - · - · -	not x 24-foot access gate	D8120	3	EA	\$3,500.00	\$10,500.00	
			<u></u>					·	
		Dewatering During C	onstruction:						
		· · · · · · · · · · · · · · · · · · ·	dwater flows into excavation.						
		Structural Excavation	n and Backfill						
		Assume all comm	on material excavated under site excavation	n for yard.					
		Assume stockpile	rock for later use as riprap or rockfill.						
				l					
	14	Excavation of rock for	structures (drill & shoot)	D8120	246,500	CY	\$15.00	\$3,697,500.00	
	15	Furnish backfill for str	uctures (assume local borrow)	D8120	44,000	CY	\$4.00	\$176,000.00	
	16	Place backfill around s	tructures	D8120	44,000	CY	Included above		
l	17	Compact backfill arou	nd structures	D8120	44,000	CY	\$5.00	\$220,000.00	
Ĺ	18	Rock Exc. for manifold	d pipe to edge of Service Yard	D8120	96,000	CY	\$15.00	\$1,440,000.00	
	19	Furnish, place, & com	pact backfill for manifold pipe trench(assu	D8120	77,600	CY	\$9.00	\$698,400.00	
	20	Furnish & place soil co	ement for manifold pipe trench	D8120	10,200	CY	\$55.00	\$561,000.00	
			Sheet Subtotal					\$18,793,100.00	
		QU	ANTITIES	<u> </u>		PF	RICES		
ву	Dick Lai	rond	CHECKED LW.	вч (Gy		CHECKED		
	M.R. O'3	Shea	M.R.O. Tun	4	Aig Grush		90/	8/17/04	
DATE PR	EPARE1	<u> </u>	PEER REVIEW	DATE PREP	PARED		PEER REVIEW	Da.0	
4/19/04				08/17/04			90/ 8/17/04 PEER REVIEW DELL		

FEATURE:			PROJECT:						
Priest Switch	Rapids	s Intake, Pump/Generating Plant, and Conveyance System To/From BRR	Yakima River Basin Water Storage Options				ptions		
		ate Conveyance System - Q= 3,500 cfs	REGION	PN	PRICE	LEVEL:	Appraisal		
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PLANT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
. —		STRUCTURAL			<u> </u>				
		Construct Building Structure							
		Furnish, form, and place reinforced concrete	D8120	113,600	CY	\$350.00	\$39,760,000.00		
	22	Furnish and place concrete reinforcement. Assume 110 #/CY	D8120	12,500,000	LBS	\$0.75	\$9,375,000.00		
	23	Furnish and handle cement (.282T/CY)	D8120	32,035	TONS	\$110.00	\$3,523,850.00		
		Furnish & install precast, prestressed double tees for roof	 		<u> </u>	**	#2 #40 000 00		
	24	10LDT 32+2 = 10' wide & 32" deep - 80' Span	D8120	48	EA.	\$50,000.00	\$2,400,000.00		
_									
						 -			
				•	 				
		Structural Steel					4200 000 00		
	- 25	Furnish and install structural steel (painted):	D8120	72,000	LBS	\$4.00	\$288,000.00		
	-	crane rails, baseplates							
	ļ								
	76	Miscellaneous Metalwork Furnish and install miscellaneous metalwork	D8120	250,000	LBS	\$7.00	\$1,750,000.00		
	1 - 20	Includes gratings, hatches, ladders, guardrails,		25,000					
		catwalk, and cable trays and supports							
			···						
<u></u>	-					· · · · · · · · · · · · · · · · · · ·			
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		<u> </u>				ļ	•		
	.]	PG - Civil/Structural Subtotal					\$75,889,950.00		
		QUANTITIES			PF	RICES			
BY	M. R. O	Shea CHECKED. w	_	Craig Grush		CHECKED	(8/17/04		
DATE PI	4/19/04		DATE PRE	PARED 08/17/04		PEER REVIEW	DED		

	F EATURE: Priest Rapids Intake, Pump/Generating Plant,			PROJECT: Yakima River Basin Water Storage Options							
Priest Switch	Rapids	s Intake, Pump/Generating Plant, and Conveyance System To/From BRR	,	Yakima River	Basin W	ater Storage Optic	ons				
		rate Conveyance System - Q= 3,500 cfs	REGION	PN	PRICE LEVEL:		Appraisal				
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	T . "	ai		ice visions quite at 10	apata i unit	Sti_5500 124 1.465 jour					
ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT				
		Major Mechanical Equipment		·							
]										
		Prices below telephone quote from Bob Rittase, Voith Hydro, 7	17-792-7206				<u>-</u>				
	 	500 cfs two-stage spiral case pump, rated 500cfs at 1430 ft	+								
	 -	total dynamic head, ov verall efficiency more than 83%			<u> </u>						
	·	operating range from 1030 to 1430 feet	1								
	† i	Pumps	D8420	3	EA	\$5,000,000.00	\$15,000.000.00				
		Motors	D8420	3	EA	\$2,500,000.00	\$7,500,000.00				
		Spherical discharge valves, with operators, rated at 1500 ft									
	3	working pressure and 12000 ft surge pressure, with operators	D8420	3	EA	\$3,000,000.00	\$9,000.000.00				
	4	Installation supervision of 500 cfs pumping unit	D8420	3	EA	\$1,000,000.00	\$3,000,000.00				
		1000 cfs two-stage spiral case pump, rated 1000 cfs at 1430 ft									
		total dynamic head, overall efficiency more than 83%									
		operating range 1030 to 1430 ft									
	5	Pumps	D8420	2	EA	\$9,000,000.00	\$18,000,000.00				
	6	Motors	D8420	2	EA	\$4,500,000.00	\$9,000,000.00				
	.	Spherical discharge valves, with operators, rated at 1500 ft				ļ					
	_	working pressure and 12000 ft surge pressure, with operators	D8420	2	EA	\$4,500,000.00	\$9,000,000.00				
	- 8	Installation supervision of 1000 cfs pumping unit	D8420	2	EA	\$1,500,000.00	\$3,000,000.00				
	T	Turbines									
	9	Turbine Weight	D8420	632,000	LBS	\$13.00	\$8.216.000.00				
		CF3 18-8 Stainless Runner 8.6' dia.									
		2 Turbines-Vertical Francis, 204,490 Hp ea.									
		400 rpm, 1130 ft. Design Head (Wt/Unit= 316,000 lbs)									
ŀ	10	Digital Governor, 322,600 ftlbs.	D8420	2	EA	\$300,000.00	\$600,000.00				
		1,000 psi system, 2 governor systems									
İ		required in total (One per unit)									
	ļ										
	<u> </u>	2 Governor Pressure Tanks 1800 Gal. each,	D8420	16,940	LBS	\$7.00	\$118,580.00				
<u> </u>	 	piping and appurtenances. (Wt/Tank= 8,470 lbs)									
]		Churt Cultantal					\$92 424 590 00				
		Sheet Subtotal QUANTITIES	1		F	RICES	\$82,434,580.00				
ву	Richard I	w	ву (`	<u>'</u>						
["	Toby Tu		· -	aig Grush		BOV	8/17/04				
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FEAT			PROJECT:							
		s Intake, Pump/Generating Plant,		Yakima River	Basin W	ater Storage Optio	ons			
		and Conveyance System To/From BRR rate Conveyance System - Q= 3,500 cfs	REGION	PN	DDICE	LEVEL:	Appraisal			
Pump	Gener	rate Conveyance System - Q= 3,500 cis	EH E		·K.					
PG - Me	chanic	al	1	C:\Documents and Revisions\[Pricst R	Settings\bv: apids Pump	anotte\Desktop\Black Ro Gen_3500 Rev 1.xls}Sur	ck\Black Rock nmary			
					ĺ					
PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT			
P AO	P.A.									
					<u> </u>					
					<u>.</u>					
					ļ					
		FURNISII-AND-INSTALL THE FOLLOWING:	 			 				
	l				<u> </u>					
		Steel Manifold and Suction Tubes	D8420		1					
		Steel plate used for pipe fabrication:			 					
		ASTM A572 Gr. 50: Sy = 50 kpsi St = 65 kpsi								
		(All pipe sizes are inside diameters)			ļ					
	12	192" Dia., 3 5/8" wall, L= 1023 ft.	 	7,800,000	LBS	\$2.00	\$15,600,000.00			
	12	172 (7)11, 0 (7)10 Wall, E 1023 II	· · · · · - 	7,000,000	200					
	13	146" Dia., 2 ¹³ / ₁₆ " wall, L= 271 ft.	1 :	1,250,000	LBS	\$2.00	\$2,500,000.00			
	14	170" Dia., 1" wall, L= 134 ft.		260,000	LBS	\$2.00	\$520,000.00			
	15	120" Dia., 78" wall, L= 122 ft.		150,000	LBS	\$2.00	\$300,000.00			
. 										
	16	110" Dia., 2 1/8" wall, L= 305 ft.		780,000	LBS	\$2.00	\$1,560,000.00			
		Toolings and the state of the s		400.000						
	17	78" Dia., T ¹ / ₂ " wall, L= 460 ft.		590,000	LBS	\$2.00	S1,180,000.00			
			ļ l		ļ					
	 -	Tunking Chand Value	D-8420		 	•				
	18	Turbine Guard Valves Two - 102" Dia. Spherical valve with hydraulic operators	17-6+20							
	10	180,000 lbs. per valve	-	360,000		\$10.00	\$3,600,000.00			
		Totava tab. par varia	1	500,000			10,000,000			
h		· · · · · · · ·					 .			
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	ļ			 .						
<u>.</u>		Sheet Subtotal	1				\$25,260,000.00			
		QUANTITIES			P	RICES	\$23,200,000.00			
BY	Narhan N	Vakamoto, D8420 CHECKED	ву (CHECKED				
		Rick Frisz, D8420		Craig Grush		BOV 8.	17/04			
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FEAT		s Intake, Pump/Ge	norating Plant	PHOJE		r Basin Wat	ter Storage Optio	ns
			ystem To/From BRR		- I GRIDA ALVO			
			System - Q= 3,500 cfs	REGION	PN	PRICE L	EVEL:	Appraisal
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PLANT ACCOUNT	PAY ITEM	I	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	Ī	Mechanical (cont)					<u>-</u>	
	10	CVM High Programs Fire	e Extinguishing System:	D-8410		each	\$100,000.00	\$300,000.00
<u> </u>	19	16 - 100# Storage Cylin		D 0410				
	 	and appurtenances and			 -			
		sch. 80 carbon steel pip				·		
	ļ <u>. </u>					L.S.		\$225,000.00
	20	Fire Suppression System		D-8410		- L. L.		\$223,000.00
<u> </u>		12 Fire hose reels w/ 10						
		24 - Portable hand-held				+		
			arbon steel pipe, valves & fittings		·			
		11 - Fire pump, spht-cas	e, 500 gpm @ 300 ft of head					
·	21	Unit Cooling Water Sy	stem:	D-8410	1	L.S.		\$275,000.00
	-		ps, end-suction type, 150 gpm					
		2 - 8-inch automatic, se		.				
			pper tubing, valves & fittings					
			n. mechanical joint pipe & fittings					
ļ								
	22	Lubricating Oil System	n:	D-8410	<u> </u>	L.S.		\$60,000.00
		2- 500 gal carbon steel	storage tanks					
!		I - 10 gpm @ 100 psi c	oil pump					
	<u></u>	1 - lube oil filter	<u></u>					
		4,000 lbs. of sch. 40 ca	rbon steel pipe, valves & fittings					
								E110.000.00
	- 23	Compressed Air System		D-8410	<u>1</u>	L.S.		\$110,000.00
		-	rotary screw air compressors					
-		1 - 250 gal, carbon stee	air receiver					
	- -	1 - 200 cfm air dryer	rbon steel pipe, valves & fittings			 	-	
		4,000 ins. or sen. 40 ca	adon sieer paper varves de tittings			·		• •
	24	Service Water System:		D-8410	1	L.S.		\$110,000.00
	1		o. 75 gpm @ 200 ft. of head			- † ··		
	<u> </u>	1 - Hydropneumatic Ta				'		
		·	pper tubing, valves & fittings					
								4250.000.00
	25	Gravity Drainage Syste		D-8410	1	L.S.		\$350,000.00
l	-	60 - Floor drains, cast i						
<u></u>	-		hub & spigot, service weight					
ŀ		soil pipe	Sheet Subtotal					\$1,430,000.00
-			ANTITIES		***	P	RICES	1
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1	John Gr	ass	ANR		Craig Grush		BOV	8/17/04
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FEAT		_		PROJE				
		s Intake, Pump/G		,	Yakima River	Basin W	ater Storage Optic	ons
			System To/From BRR System - Q= 3,500 cfs	REGION	PN	PRICE	LEVEL:	Appraisal
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, 5	7		" ''					
PLANT	PAY ITEM		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
4 Q	₹ .							
		Mechanical (cont)				<u>.</u>		
	26	Plant Unwatering Sys	tem:	D-8410	I	L.S.		\$210,000.00
	<u> </u>	2 - Vertical turbine ty	pe sump pump, 1000 gpm @ 50 ft hd		-·· ··· ··- ·			
		1 - Drainage jet type o	Irainage pump				<u> </u>	
	ļ	1,500 lbs. of type K or	opper tube, valves & fittings					
	<u> </u>	5,000 lbs. of ductile in	on, mechanical joint pipe & fittings			ļ		
	ļ					<u> </u>		
	27	Domestic Water and S	Sanitary Waste System:	D-8410	1	L.S.		\$100,000.00
		4 - Water Closets	 					
		2 - Urinal				.[-	
		4 - Lavatories & acces	ssories					
		I - Duplex Sewage Ej						
	ļ	2,000 lbs. of cast iron	hub & spigot service weight					
		sewer pipe						
		800 lbs. of type K cop	per tubing, valves & fittings					
	<u> </u>							
	_							
				.				
	28	200-Ton overhead cra	ne, 72'-6" span, two required	D-8410	520,000	LBS	\$6.00	\$3,120,000.00
	- 29	Electric traction cleva		D8410	I	unit	\$500,000.00	\$500,000.00
	·	overhead, geared, cap						
		travel = 100 feet, land	ings = 6, speed = 200 ft/min.					
	l							
	30	Ultrasonic flowmeter,	4-path	D8410	1	meter	\$35,000.00	\$35,000.00
		T. I. I. C. II.		D9410	77.000	1.06	64.00	£200 000 00
	51	Trashracks (steel) at p	umping plant	D8410	77,000	LD3	\$4.00	\$308,000.00
	23	Charles Lifting hours	and mider (steel)	D9410	54,000	1.00	\$4.00	\$216,000.00
	.32	Stoplogs, lifting beam	oplogs for each size pump bay,	D8410	. 34,000	LD3	\$4.00	
			assumes five sets of guides)					
		two sizes of bays, and	assumes rive sets of guides)					
		Rulkhead gates lifting	g beam and guides (steel)	D8410	80,000	LBS	\$4.00	\$320,000.00
	1 32	· · · · — — — — — — — — — — — — — — — —	ilkheads for isolation of 1 turbine)	170410			04.00	3320,000.00
	· 	(assumes six sets of g					<u> </u>	
		(assumes six sets or g	andes)					
	-							
	<u> </u>		Sheet Subtotal					\$4,809,000.00
	1	Qı	JANTITIES			F	PRICES	. , , , , , , , , , , , , , , , , , , ,
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1	Berte, J. C		Ana	1	nig Grush			8/17/011
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FEATL		No. 10 No	PHOJEC1: Yakima River Basin Water Storage Options							
Priest F	Rapid	ls Intake, Pump/Generating Plant, and Conveyance System To/From BRR		Yakima Kive	r Basın vva	ter Storage Opu	ons			
Switch; Pump/t	yaru a Gene	rate Conveyance System - Q= 3,500 cfs	REGION	PN	PRICE L	EVEL:	Appraisal			
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PEANT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT			
		Mechanical (cont)	_							
	<u> </u>	VV C V-sll-ti-z and Air Conditioning	D-8410	<u> </u>	L.S.		\$2,873,150.00			
. ——	 	Heating, Ventilating, and Air Conditioning HVAC for bulding except bus & switchgear	+	·	.]		 			
		476.5-ft long by 77'-ft wide by 70-ft high unit/service bay	+ -+	··-	-					
	├ ─·	54-ft long by 77-ft wide by 70-ft high unitservice day	+		+					
<u> </u>	·	Two each 54-ft long by 77-ft wide by 17-ft equipment rooms	+				 			
·	 -	418-ft long by 56'-ft wide by 20-ft high Electrical Gallery		·-	+-		 			
<u> </u>		Pump/Motor/Valve Galleries= 1,000,000 ft/3			 					
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<u> </u>	 	PG - Mechanical Subtotal			1		\$116,806,730.00			
		QUANTITIES	 		P	RICES				
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	Paul Sci	thein Ana		Traig Grush		BI	1V 8/17/c4			
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FEAT			PROJE				
Priest	Rapids	s Intake, Pump/Generating Plant,		Yakima Rive	r Basin '	Water Storage (Options
		and Conveyance System To/From BRR rate Conveyance System - Q= 3,500 cfs	REGION	PN	PRICE	LEVEL:	Appraisal
Pump/ PG-Elec		ale Conveyance System - Q= 0,000 00	FILE:	C:\Documents an	nd Settings\u00fchvanotte\Desktop\Black Rock\Black Rock Rapids PumpGen_3500 Rev 1.xls Summary		
	Τ						
PLANF	РАУ ГТЕМ	DESCRIPTION	CODE	QUANTITY	TIAU	UNIT PRICE	AMOUNT
			D8430		·		
	-	Electrical Generator (F&I)	108430		EA	\$2,450,000	\$4,900,000.0
	<u> </u>	150,000 kVA, 13.8 kV, 3-phase, 60 Hz.	· ·		LA	\$2,430,000	\$4,700,000.0
	 -	400 rpm, 95% power factor		··	<u> </u>		
		Vertical, synchronous machine					
	 	Static excitation system & voltage regulator			İ		
		Plant Grounding System (F&I)	D8430			<u></u>	
	2	Ground rods, 10 ft, 3/4" dia., copper-clad			EA	\$180.00	0.008,012
		Stranded bare-copper conductor					
	3	250 MCM			LF	\$5.50	\$8,250.0
<u>—</u>	4	4/0 AWG		1,200	LF	\$4.00	\$4,800.0
	5	2/0 AWG		1,200	Ľ <u>F</u>	\$3.50	\$4,200.0
	6	4 AWG		1,000	LF	\$2.50	\$2,500.0
	-	Motor Bus & Switchgear (F&I)	D8430				
		Main motor isolated-phase bus:		300	LF	\$5,000.00	\$1,500,000.0
	ļ'	15 kV: 24,000 amperes; 3-phase; 60 hz.					
	-	Self-cooled					
<u> </u>	١ .	Individual motor isolated-phase bus:	<u> </u>				
<u> </u>		15 kV; 3,500 amperes; 3-phase; 60 hz.		150	LF	\$1,500.00	\$225,000.0
		Self-cooled					
				100	LF	\$2,000.00	\$200,000.0
		Self-cooled	· · · · · ·		-	1 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	
	 -	Sch-cooled					
	ŀ	Motor reduced-voltage, static starting system with					
		15 kV, SF6 type unit circuit-breakers					
	10	3,500 amperes continous current		3	EA	\$240,000	\$720,000.0
		7,000 amperes continuous current		2	EA	\$275,000	\$550,000.00
	ļ	Classical and CERT	D8430				
l	12	Generator Bus & Switchgear (F&I) Generator isolated-phase bus:	136430	250		\$4,000.00	\$1,000,000.0
		15 kV; 15,000 amperes, 3-phase; 60 hz.		230	Li	\$4,000.00	\$1,000,000.00
		Self-cooled				-	
			I ·				
	13	Generator unit circuit breaker		2	EA	\$900,000	\$1,800,000.0
	1	15 kV, SF6 type circuit breakers					
	<u></u>	7,000 amperes continuous current					
							010 D25 FF0 D
		Sheet Subtotal QUANTITIES			P	RICES	\$10,925,550.00
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ВУ	Mike Sc	CHECKED	ву С	L for: Elizabeth Tran		CHECKED ##	1 8/19/04
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	5/20/04	i e	DATE PREPARED 08/17/04 CHECKED DOV 4/19/04 PEER REVIEW 08/17/04				UEN-

FEAT		s Intake, Pump/Generating Plant,	PROJEC1: Yakima River Basin Water Storage Options						
Switch	yard a	nd Conveyance System To/From BRR							
		ate Conveyance System - Q= 3,500 cfs	FILE:	FILE: C:\Documents and Settings\bvanotte\Desktop\Black Rock\Black Revisions\\Priest Rapids PumpGen_3500 Rev 1.xls\Summary					
PG-Elec				Revisions\Pries	t Kapids Pu	mpcien_3300 KeV 1.	xisjaumury		
PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
		C A DE COMPANY OF STATE OF STA	D8430				<u> </u>		
		Motor Control Equipment (F&I)	D0430		EA	\$200,000	\$200,000.0		
		Duplex control switchboard for operation of 5 main pumping motors.							
		C (FPT)	D8430		1	<u>-</u>			
	<u> </u>	Generator Control Equipment (F&I)	100430		EA	\$500,000	\$500,000.0		
·	15	Duplex control switchboard for operation of 2		·	EA	. \$500,000	\$500,000.0		
	-	generators		· ··-		·			
		Motors (Listed under Plant Mechanical)			<u> </u>				
·	ļ	15 kV Metal-Clad Switchgear (F&I)	D8430		 				
	16	15 kV metal-clad switchgear rated 1200 amperes with			EA	\$350,000	\$350,000.0		
	ļ	two 1200 ampere vacuum type power circuit breakers			1				
<u> </u>		15 kV Non-Segregated-Phase Bus (F&I)	D8430						
	 17	15 kV, 1200 amperes		200	FT	\$800.00	\$160,000.0		
	<u>-</u> -				1				
	·	Plant Battery System (F&I)	D8430		†				
	18				I EA	\$30,000.00	\$30,000.00		
	19	<u> </u>	<u> </u>		EA	\$10,000.00	\$20,000.00		
	20]	EA	\$12,500.00	\$12,500.00		
	ļ	and molded-case circuit breakers							
		Plant Station-Service Equipment (F&I)	D8430			 			
	 	Indoor double-ended secondary unit substation with	1.0430			· -			
	 	Following features:			 -				
ŀ	21	Dry-type transformer 13.8 kV-480Y277 V; 3,000 KVA			EA	\$110,000	\$220,000.00		
	22			12		\$4,500.00	\$54,000.00		
		too reports one on the control of th							
	ļ	Building Lighting System (F&I)	D8430						
	ļ	Interior luminaires	· · ·	2.0	<u> </u>	******************	405.000.00		
	23				EA	\$700.00	\$25,200.00		
	24	4 foot fluorescent lighting fixtures, 2 lamp		40	EA	\$220.00	\$8,800.00		
1	25	Emergency lighting system		1	LS	<u> </u>	\$900.00		
ļ	26	Exterior luminaires			EA	\$400.00	\$5,600.00		
<u> </u>	† <u>-</u> -	High-pressure sodium, wall mounted, outdoor							
		70 watt, 120 volt			ļ				
		Sheet Subtotal	•				\$1,587,000.00		
		QUANTITIES			Р	RICES			
BY	Mike Sch	CHECKED L Rossi	ву С	Elizabeth Tran		CHECKED 60√	8/13/64		
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Priest I	FEATURE: Priest Rapids Intake, Pump/Generating Plant, Switchyard and Conveyance System To/From BRR		nerating Plant,	PROJE	_	er Basin	Water Storage (Options			
Switch; Pump/i	yaru a Gener	ate Conveyance Sy	/stem - Q= 3,500 cfs	REGION	PN	PRICE	LEVEL:	Appraisal			
PG-Elec				FILE: C:ADocuments and Settings\bvanotte\Desktop\Black Rock\Black Revisions\Priest Rapids PumpGen_3500 Rev 1.xls Summary							
PLANT	PAY ITEM	D	ESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT			
	27	Building Fire Detection	and Alarm System (F&I)	D8430	1	LS		\$150,000.0			
	28	Distribution Panelboa 480 volts, 3-phase with		D8430	4	EA _	\$24,500.00	\$98,000.0			
		Motor Control Center 480 volts, 3-phase with Six 20 inch wide section 4 NEMA size 4 starters		D8430	2	EA	\$195,000	\$390,000.0			
 		Insulated Conductors 600-volt, single-conduc		D8430							
	30 31 32	12 AWG			12,000 15,000 15,000	† ···	\$0.50 \$0.55 \$0.70	\$6,000.0 \$8,250.0 \$10,500.0			
	33 34 35	4 AWG			3,000 3,000 2,000	LF	\$1.50 \$1.75 \$2.75	\$4,500.0 \$5,250.0 \$5,500.0			
	36	600-volt multi-conductor 9 conductor 16 AW			2,000	LF	\$1.25	\$2,500.0			
	37				3,000		\$1.50 \$1.75	\$4,500.0 \$5,250.0			
		Conduit System (F&I)		D8430							
	39				1,000		\$14.00 \$22.00	\$14,000.00 \$17,600.00			
	41	2 1/2 inch			400	LF	\$30.00 \$42.00	\$12,000.00 \$16,800.00			
	43	Plastic-coated rigid stee			500	LF	\$30.00	\$15,000.00			
			G - Electrical Subtotal			P	RICES	\$13,278,200.00			
ву	Mike Scl	o nub	HECKED L Rem	ву С	L for ! Elizabeth Tran		CHECKED \$0√	8/17/04			
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	TURE:			PROJECT: Yakima River Basin Water Storage Options						
Priest Switch	Rapids Intake, Pump/Generating Plant, hyard and Conveyance System To/From BRR /Generate Conveyance System - Q= 3,500 cfs		nerating Plant, vstem To/From BRR		Yakıma Kiv	ei Dasili v	attr Storage			
Pump/	Gener	rate Conveyance S	system - Q= 3,500 cfs	REGION	PN	PRICE LEVEL:		Appraisal		
Switchy		•		FILE:	C:\Documents a Revisions\[Pries	cuments and Settings\hvanotte\Desktop\Bions\Priest Rapids PumpGen_3500 Rev }		lack Rock\Black Rock xls Summary		
PLANT ACCOUNT	РАУ ІТЕМ		DESCRIPTION	CODE	QUANTITY	TINU	UNIT PRICE	AMOUNT		
							<u> </u>			
		STRUCTURAL		D8120						
			d structures covered under							
	<u> </u>	unlisted items.				· ·				
		ELECTRICAL			·					
	ļ 	Switchyard			··	 	· -			
	-	Furnish and Install:				<u> </u>				
·			ator-type power transformer	D8440	3	EA	\$3,850,000	\$11,550,000.00		
	Ī	520 MVA; 500-13	3.8kV, 1-phase							
	- 	2 500-kV disconnec	t switches, 1200 amp, 3-phase	D8440	4	EA_	\$125,000	\$500,000.00		
		3 500-kV circuit bro	eakers, 1200 amp, 3-phase	D8440	2	EA	\$1,115,000	\$2,230,000.00		
	- -									
		4 Construct Transmiss		D8440		MILES	\$1,000,000	\$6,000,000.0		
<u> </u>	·		f transmission line from		~	, mess				
<u> </u>		Midway substatio				T				
		······································	ers, 2167 AWG conductor			-				
	- .									
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<u></u>						-				
		······································	<u>-</u>							
	_		<u> </u>							
	· [
	_		Switchyard & Transmission Line	Subtotal			<u></u>	\$20,280,000.0		
		QL	JANTITIES		<u> </u>	PI	RICES			
BY L. Gamus	ciello (D8-	440)	CHECKED	ву С	Flizabeth Tran		CHECKED &Ø√	8/17/04		
	REPARE	 	PEER REVIEW	DATE PRE		-	PEER REVIEW	8/17/04 DCD		
4/15/200)4		James R. Zeiger (D8440)		08/17/04	ı		NW		

-	ATURE: est Rapids Intake, Pump/Generating Plant,		Yakima River Basin Water Storage Options					
		s Intake, Pump/Generating Plant, nd Conveyance System To/From BRR	Ì	i akima Kiver	YV 111.61541	ater Storage O	perons	
Pump/	Gener	ate Conveyance System - Q= 3,500 cfs	REGION	PN	PRICE	LEVEL:	Appraisal	
Tunnel/	Tunnel					anotte\Desktop\Black Gen_3500 Rev 1.x	ek Rock\Black Rock	
DISCHA	1		<u> </u>	KCVINIONS (Friest K	ipids rump	Gen_a,oo Rev 1.x	S Summing	
PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	TAUOMA	
				—				
	ļ	Construct Tunnel	l		<u> </u>			
	<u> </u>	Construct 34,850-ft long, 17.00-ft finished diameter, 20.00-ft i					e T	
		excavated with TBM and driven uphill. Water problems will	be minimal. T	unnel has three	mai sup	port reaches.		
	ļ	<u> </u>						
	 	32,150-ft long unreinforced concrete lined reach	- -					
	 ;	Excavation (appr 12 cy/lf)	D-8140	32,150	lí	\$1,700.00	\$54,655,000.00	
		Dictivation (appl 12-0).wy						
	2	Furnish and place unreinforced concrete tunnel lining	D-8140	104,000	су	\$350.00	\$36,400,000.00	
	3	Cementitious materials for concrete tunnel lining	D-8140	29,300	tons	\$110.00	\$3,223,000.00	
						\$45.00	410 260 000 00	
	4	Furnish & install 7/8-in dia, 10-ft long rock bolts	D-8140	228,000	lin ft	\$45.00	\$10,260,000.00	
} ·	<u> </u>	1,000-ft long reinforced concrete lined reach						
	5	Excavation (appr 12 cy/lf)	D-8140	1,000	lf	\$2,500.00	\$2,500,000.00	
	···	Exercise (app. 13-5) (b)	<u> </u>	 .				
	†··· 6	Furnish and place reinforced concrete tunnel lining	D-8140	3,230	су	\$350.00	\$1,130,500.00	
<u> </u>				<u>-</u>				
	7	Cementitious materials for concrete tunnel lining	D-8140	910	tons	\$120.00	\$109,200.00	
	8	Furnish and install concrete reinforcement	D-8 <u>140</u>	50,400	. <u>Ibs</u>	\$1.00	\$50,400.00	
		Furnish and install structural steel tunnel supports	D-8140	422,000	lbs	\$4.00	\$1,688,000.00	
	9	rumsh and fistall structural sect tunner supports	- - -	1722,000				
—		1,700-ft long steel lined portal reach						
	10		D-8140	1,700	1f	\$2,500.00	\$4,250,000.00	
		Steel Tunnel Liner:						
		ASTM A572 Gr. 50: Sy = 50 kpsi St = 65 kpsi						
	11	204" Dia., 3 7/8" wall, L= 1700 ft.	D-8420	14,639,000	LBS	\$2.00	\$29,278,000.00	
			D 0140	5.400	407	\$300.00	\$1,647,000.00	
	- 12	Furnish and place backfill concrete	D-8140	5,490	_ cy	.5300.00	.\$1,047,000.00	
	13	Cementitious materials for backfill concrete	D-8140	1,550	tons	\$130.00	\$201,500.00	
	1.5	Continuous materials for oddring districts						
·	14	Furnish & install 7/8-in dia, 10-ft long rock bolts	D-8140	8,400	lin ft	\$55.00	\$462,000.00	
<u> </u>	15	Furnish and install structural steel tunnel supports	D-8140	422,000	lbs	\$4.00	\$1,688,000.00	
		Sheet Subtotal					\$147,542,600.00	
		QUANTITIES			PI	RICES		
BY		empson (D8140) CHECKED 44	вч С	1/		CHECKED BOW	1 9/0/14	
		sz (D8420)	DATE PRO	Craig Grush			8/17/34	
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	44.13/04	·		20,11,10			/ V V	

FEATL			PROJECT:						
		Intake, Pump/Generating Plant,		Yakima River Basin Water Storage Options					
Switch; Pump/(yard al Genera	nd Conveyance System To/From BRR ate Conveyance System - Q= 3,500 cfs	REGION	PN	Appraisal				
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PLANT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
				<u></u>					
		Construct Surge Shaft		<u> </u>					
		Construct 1506-ft deep, 22.0-ft finished diameter, 24.34-ft mi	nimum bore di	iameter, shaft in	rock. St	naft will be			
		excavated by raise bore and drill down method. Water proble	ems will be min	nimal. Shaft has	s two fina	l support reaches	·		
	<u> </u>	1,200-ft deep unreinforced concrete lined reach		<u>-</u>					
	16		D-8140	1,200	10	\$6,000.00	\$7,200,000.00		
			D 9140	3,800		\$350.00	\$1,330,000.00		
——	17	Furnish and place unreinforced concrete shaft lining	D-8140 1	3,800	су	.,55.0.00	φ1,330,000.or		
. <u>.</u> . –	18	Cementitious materials for concrete shaft lining	D-8140	1,070	tons	\$130.00	\$139,100.00		
		The investigation of the Company of the bottom	D-8140	63,100	lin ft	\$50.00	\$3,155,000.00		
	19	Furnish & install 5/8-in dia, 6-ft long rock bolts	D-8140				Ψ2,122,000,00		
		300-ft long reinforced concrete lined shaft top reach	D-8140	300	If	\$6,000.00	\$1,800,000.00		
	20	Excavation (appr 17 cy/lf)	D-8140			30,000.00			
	21	Furnish and place reinforced concrete shaft lining	D-8140	945	су	\$400.00	\$378,000.00		
	22	Cementitious materials for concrete shaft lining	D-8140	265	tons	\$160.00	\$42,400.00		
		Cententitions materials for consistent and							
	.23	Furnish and install concrete reinforcement	D-8140	15,700	lin ft	\$1.00	\$15,700,00		
		Furnish & install 5/8-in dia, 6-ft long rock bolts	D-8140	15,600	lin ft	\$50.00	\$780,000.00		
	<u> </u>								
	25	Furnish and install chain link protection	D-8140	13,000	sq yd	\$20.00	\$260,000.00		
									
	<u> </u>								
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		Sheet Subtotal					\$15,100,200.00		
	·	QUANTITIES			PF	RICES			
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FEAT	URE:		PROJE				'
Priest	Rapids	s Intake, Pump/Generating Plant, and Conveyance System To/From BRR		Yakima River !	Basin Wa	ater Storage Opt	lions
Pump/	/Gener	rate Conveyance System - Q= 3,500 cfs	REGION	PN	PRICE I	LEVEL: A	Appraisal
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							.
PLANT	PAYITIM	DESCRIPTION	СОВ	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Construct Multi-Level Intake at Black Rock Reservoir					
	-	CNII	<u> </u>				 -
		CIVIL Structural Excavation and Backfill					
	 	Assume T. O Rock is 60 feet below top of ground		–			
		Assume stockpile rock for later use as riprap.			·····		
	26	Common excavation for structures	D8120	138,500	CY	\$10.00	\$1,385,000.00
		Rock excavation for structures (drill & shoot)	D8120	137,500	CY	\$15.00	\$2,062,500.00
		Furnish & install grouted pretensioned tendons	D8120	100	EA	\$30,000.00	\$3,000,000.00
	- 20	Assume 100 holes, each 60 foot deep,					
<u> </u>		Hole diameter= 8 inches					
		Each hole has 27 0.5-inch diameter 7-wire,					
	+	flow-fill, cpoxy coated strand w/ ult. strength= 270 ksi					
		now-mi, choxy coated straind with the strength - 270 No.	<u> </u>				·
<u>.</u>		STRUCTURAL					
	T	Construct Intake Structure		·			
	29	Furnish, form, and place reinforced concrete	D8120	124,500	CY	\$350.00	\$43,575,000.00
	30	Furnish and place concrete reinforcement.	D8120	12,450,000	LBS	\$0.75	\$9,337,500.00
		Assume 100 #/CY					
	31	Furnish and handle cement (.282T/CY)	D8120	35,110	TONS	\$110.00	\$3,862,100.00
							··
		Structural Steel	D8120	50,000	LBS	\$4.00	\$200,000.00
	32	Furnish and install structural steel (painted):	D8120		LDD	J-4.00	φ200,000.00
		Includes monorail girder and hoist frame.			—		
		Miscellaneous Metalwork	D8120	50,000	LBS	\$7.00	\$350,000.00
	33	Assume ladders in shafts, elevator rail					
		supports, misc metal in valve rooms and					
·		clevator tower			ļ <u>.</u>		
	.	Construct Access Bridge					
	-	Assume 30-ft wide by 100-ft span		<u></u>	ļ		
	34	Furnish, form, and place reinforced concrete	D8120	150	CY	\$500.00	\$75,000.00
	3:	Furnish and place concrete reinforcement.	D8120	19,500	LBS	\$1.00	\$19,500.00
		Assume 130 #/CY					
	30	6 Furnish and handle cement (.282T/CY)	D8120	45	TONS	\$160.00	\$7,200.00
	3_	Furnish and install structural steel (painted):	D8120	250,000	LBS	\$4.00	\$1,000,000.00
l							
	-						
ŀ	ļ	Sheet Subtotal	-				\$64,873,800.00
		QUANTITIES			PF	RICES	
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	ATURE: est Rapids Intake, Pump/Generating Plant,		PROJECT: Yakima River Basin Water Storage Options					
riest l	Rapids	s Intake, Pump/Generating Plant,	,	Yakima River i	Basin Wa	iter Storage O	puons	
witch) اربست	yard a Gener	nd Conveyance System To/From BRR ate Conveyance System - Q= 3,500 cfs	REGION	PN	PRICE LEVEL:		Appraisal	
Pump/ Discharç		and the according to the second secon	FILE:	CADocuments and S Revisions\[Priest Ra	Settings\bvar ipids Pump(notte\Desktop\Blac Jen_3500 Rev 1.xl:	k Rock\Black Rock s Summary	
				A		LIFIGH BACKS	ANAMIL	
PLANT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT	
		Mechanical - Multi-level Intake at BRR						
			+				<u> </u>	
···	<u> </u>	FURNISH-AND-INSTALL THE FOLLOWING:						
		Steel Piping:						
		Steel plate used for pipe fabrication:			ļ—	·	<u> </u>	
		ASTM A36; Sy = 36 kpsi			 	·		
		(All pipe sizes are inside diameters)			<u> </u>	<u> </u>	-	
	38	102" Dia., 7/16" wall, L= 252 ft.	D8420	120,000	LBS	\$2.00	\$240,000.00	
	39	102" Dia., 5/16" wall, L= 756 ft.	D8420	260,000	LBS	\$2.00	\$520,000.00	
		Valves:						
·	40	Sixteen - 102" Dia. Butterfly valves,	D8420	400,000	LBS	\$7.00	\$2,800,000.00	
	-	150 psi class with motor operator			 			
	41	Couplings: Sixteen - 102" Dia. Pipe Couplings	D8420	16,500	LBS	\$8.00	\$132,000.00	
–		Gates:					\$4.000.000.00	
	42	Three - 17' x 7' High Pressure Roller Gates with controls	D8420	600,000	LBS	\$8.00	\$4,800,000.00	
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		Sheet Subtotal QUANTITIES		<u> </u>	DE	RICES	\$8,492,000.0	
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ву	Nathan Nakamoto, D8420 CHECKED			raig Grush		L.	DED-	
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Priest	Rapids	s Intake, Pump/Generating Plant,	,	Yakima River l	Basin Wa	ater Storage Optic	ons	
Switch Pump/	iyard a (Gener	nd Conveyance System To/From BRR ate Conveyance System - Q= 3,500 cfs	REGION	PN	PRICE I	LEVEL: A _l	ppraisal	
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	บทำ	UNIT PRICE	AMOUNT	
	 	Mechanical - Multi-level Intake at BRR	<u> </u>					
						<u> </u>		
				16,400	LBS	\$25.00	 \$410,000.00	
	43	15-Ton capacity, electric wire rope hoists for monorails 15 hp motors, 43 ft lift, 4 req'd @ 4100 lb each	D-8410	10,400		\$25.00		
	44	20-Ton capacity, electric wire rope hoist	D-8410	8,000	LBS	\$25.00	\$200,000.00	
		30 hp motor, 380 ft lift						
	<u></u>					\$600,000	 \$600,000.00	
	45	Electric traction elevator	D-8410	1	unit	\$600,000		
		overhead, geared, capacity = 3500 lbs.	—·					
		travel = 298 feet, landings = 5, speed = 500 ft/min				i	··	
		Stationary fish screens, 4 intake levels, R=25', L=100'	D-8410					
	十 [~]	Structural steel		589,000	LBS	\$4.00	\$2,356,000.00	
		Stainfess steel		393,000	LBS	\$15.00	\$5,89,5,000 <u>.00</u>	
					· 		#220 DOO NO	
	47	Trashracks around side gate openings (steel)	D-8410	80,000	LBS_	\$4.00	\$320,000.00	
	48	Bulkhead guides for isolating the two side gates (steel)	D-8410	99,000	LBS	\$4.00	\$396,000.00	
 · –		(assumes no bulkheads provided)					-	
		Bulkhead gates and guides for multilevel intakes (steel)	D-8410	266,000	LBS	\$4.00	\$1,064,000.00	
·		(assumes guides for each inlet and						
		one level set of 4 bulkheads)						
	<u> </u>							
		Heating, Ventilating, and Air Conditioning	D-8410	1	L.S.		\$440,850.00	
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	1				<u> </u>	ļ } ·	\$11,681,850.00	
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FEATL	JRE:		PROJECT:				
Priest I	Rapids	s Intake, Pump/Generating Plant, nd Conveyance System To/From BRR			r Basin Wa	ater Storage Opti	ions
witchی *صصرات	yard a Genom	nd Conveyance System 10/From BHH ate Conveyance System - Q= 3,500 cfs	REGION	PN	PRICE I	LEVEL: A	ppraisal
Pump/ Tunnel/ DISCHA	Tunnel		FILE:	C:\Documents and	d Settings\bva	anotte\Desktop\Black R Gen_3500 Rev 1.xls S	Rock\Black Rock
PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
AC.	PA PA				+	 	
		Flectrical Fauinment	 		+		 _
	 	Electrical Equipment			<u> </u>		
		Service Equipment (F&I)	D8430		+		
		Dry-type distribution transformer	_	l	EA	\$28,000.00	\$28,000.00
		13.8 kV-480Y/277 volt, 225 kVA, 3-phase, 60 hz.					
	64	Distribution switchboard, indoor type		1	EA_	\$65,000.00	\$65,000.00
	1	480 volt, 3-phase with 600 ampere bus					
	1	Molded-case circuit breakers:				ļ Ī	
1	<u> </u>	16 - 50 amp breakers		! 			
<u>-</u>		10 - 30 ampere breakers		<u> </u>			
		Low-Voltage Distribution Equipment (F&I)	D8430				
	67	Dry-type lighting transformer		2	2 EA	\$5,000.00	\$10,000.0
	T	480-208Y/120 volt, 30 kVA, 3-phase, 60 hz.				-	
ļ	68 Lighting panelboard, indoor type 208Y/120 volt, 3-phase with 100 ampere bus				2 EA	\$9,000.00	\$18,000.0
					<u></u>		
	ļ					 	
		Safety Switches (F&I)	D8430				
\	69	2 480 volt, 60-ampere, 3-pole, fusible			6 <u>EA</u>	\$800.00	\$4,800.00
 		with NEMA type 12 enclosure				<u> </u>	
	- 						
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_		Sheet Subtotal				NOE6	\$125,800.0
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Priest F	Rapids	s Intake, Pump/Generating Plant, ind Conveyance System To/From BRR			Basin Wa	ater Storage Opti	ons		
SWITCH) Dump#	yard a Senor	ate Conveyance System - Q= 3,500 cfs	REGION	PN	PRICE I	LEVEL: A	ppraisal		
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNII'	UNIT PRICE	AMOUNT		
	<u> </u>	Combination Motor Starters (F&I)	D8430			L			
	70	NEMA size 2, non-reversing contactor		20	EA _	\$3,000.00	\$60,000.00		
	ļ—	480-120 volt control transformer	- +		_	 			
		NEMA type 12 enclosure				<u> </u>			
	<u> </u>	Landard Conductors (T.S.D.)	D8430	·	 	 	·		
—	<u> </u>	Insulated Conductors (F&I)	- 50430	·	 	 			
	<u></u> 71	600-volt, single-conductor, stranded copper, THWN	-	1,500	FT	\$0.70	\$1,050.00		
	ļ	12 AWG		1,200		\$0.80	\$960.00		
	-l	10 AWG	— [——·]	800	+ -	\$1.00	\$800.00		
		8 AWG 1/0 AWG		200		\$3.00	\$600.00		
	 	DUANG			Ţ				
	<u> </u>	Conduit System (F&I)	D8430		ļ	ļ l			
	72	Rigid steel conduit	_	ļ	<u> </u>		410.000.3		
	\mathbb{L}^{-}	1 inch		<u> </u>	FT .	\$15.00	\$12,000.00		
	·	2 inch			IT	\$23.00	\$4,60 <u>0.00</u>		
	Lighting System (F&I)		D8430	 	·	· ··			
			D0430	<u> </u>	-				
<u> </u>	7.	Interior luminaries			EA	\$650.00	\$13,000.0		
l		High bay, high-pressure sodium, 200 watt		<u> </u>					
<u> </u>	+-	480-volt, 1-phase 4 foot fluorescent lighting fixtures, 120 volt, 2 lamp		12	EA	\$220.00	\$2,640.00		
·		4 1001 Hadresseat righting factors, 120 role 2 lamp							
	7.	4 Exterior luminaries			<u> </u>				
		High-pressure sodium, wall-mounted, outdoor type		<u> </u>	EA	\$400.00	\$2,400.0		
		70 watt, 120 volt			 	 			
	- 7.	5 Emergency lighting system		1	EA	\$900.00	\$900.0		
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				<u> </u>			\$98,950.0		
<u> </u>	Sheet Subtotal			<u> </u>	P	RICES	\$20,230.0		
<u></u>		QUANTITIES	ву (7 C.		CHECKED			
BY	M Sale	CHECKED	, "	Elizabeth Tran		80	V 8/17/04		
DATE			DATE OF THE PROPERTY OF THE PR] a D			
[DATE PREPARED PEER REVIEW 5/24/04			08/17/04	\$	1	led		

FEATI	TURE:				PROJECT:					
⊃riest l	Rapids	s Intake, Pump/Ger	nerating Plant,	,	Yakima River I	Basin Wa	iter Storage Opti	ons		
Switch; Pumo#	yard a Genor	nd Conveyance Sy ate Conveyance Sy	stem To/From BRR ystem - Q= 3,500 cfs	REGION	PN PRICE LEVEL: Appraisal					
Pump/ <i>Tunnel/</i> DISCHA	Tunnel	ato convoyance of	,	FILE:	:\Documents and S	ettings\bva	noue\Desktop\Black R Gen_3500 Rev 1.xls S	lock\Black Rock ummary		
PLANT	РАУ ПЕМ	ט	ESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
		Tunnel Outlet Feature	s (Beyond Mulit-Level Intake)					<u></u> .		
	<u> </u>		to valley invert and L~ 4000'							
	L		ntrol flow from tunnel portal to					·		
	<u> </u>	bottom of reservoir	during initial fill.		·			··		
<u> </u>	-	Earthwork								
	76	Excavation at outlet are	a for portal and channel	D8130		CY	\$15.00	\$750,000.00		
	+ -	Excavation for pipe tren		D8130	307,000	CY	\$5.00	\$1,535,000.00		
		Excavation for thrust bl		D8130	1,500	CY	\$15.00	\$22,500.00		
<u> </u>		Concrete for open chan	 nel	 D8130	500	CY -	\$400.00	\$200,000.00		
··		F & P reinforcement (1)		D8130	83,000	LBS	\$1.00	\$83,000.00		
·	81 Furnish and handle cement (.282T/CY)			D8130	150	TONS	\$160.00	\$24,000.00		
				D0120		CY	\$400.00	\$400,000.00		
		Concrete for thrust bloc		<u>D8130</u>	1,000		\$1.00	\$100,000.00		
		F & P reinforcement (1) Furnish and handle cerr		D8130 D8130	100,000	LBS TONS	\$160.00	\$38,400.00		
		Hurmish and handle cem	IGIR (.233 I/C I)		·					
<u> </u>	8:	5 Furnish and place Zone	3 bedding for pipe	D8130	24,000	CY	\$40.00	\$960,000.00		
		6 Backfill pipe with exca		D8130	237,000	CY	\$7.00	\$1,659,000.00		
	8	7 Furnish and place zone	3 bedding for riprap	D8130	5,000	CY	\$40.00	\$200,000.00		
	8	8 Furnish and place ripra	<u>p</u>	D8130	10,000	CY	\$35.00	\$350,000.00		
	- -	9 20 ' dia. Steel pipe L =	4000' t= 3/4 inches	D8130	8,500,000	LBS	\$2.00	\$17,000,000.0		
	+		ouplings and connections					<u> </u>		
	9	0 Steel safety trashracks		D8410	80,000	LBS	\$4.00	\$320,000.0		
	9	1 Steel Bulkhead		D8410	120,000	LBS	\$4.00	\$480,000.0		
<u> </u>	<u></u>	2 Remove and salvage 2	O' dia Steel pine		7,650,000	LBS	N/A			
l—	-} ·- '		isted removal in wet at a max		: <u></u> -	T · · · · · · · · · · · · · · · · · · ·				
	+	$depth = 100^{\circ}.$		<u> </u>			Ţ <u></u> L			
	-	· · · · · · · · · · · · · · · · · · ·	of 90% of the pipe.			I				
<u> </u>	1		o raise pipe and barge-mounted							
<u> </u>		crane to handle pi			<u></u>		ļ ——ļ.			
			n (quote), but salvage value is			_				
	much less than the cost to remove and cut up pipe.		cost to remove and cut up pipe.		·					
	+-		Discharge 1 - Subtotal					\$272,037,100.0		
		QU	IANTITIES			Pl	RICES			
BY			вч (Araig A. Grush		CHECKED Voi	1 8/19/04			
DATE	DATE PREPARED PEER REVIEW		DATE PR			GO! PEER REVIEW	Del			
1	AUTTIN		l	08/17/04 /				ver		

Priest Rapids Intake, Pump/Generating Plant, Switchyard and Inflow Conveyance System Q= 3,500 cfs

Field Cost Estimate

	Rapida		Plant, Switchyard, and	PROJECT: Yakima River Basin Water Storage Options						
Inflow (Conve	eyance System -	Q= 6,000 cfs	REGION	l PN	PRICE 1	LEVEL.	Appraisal		
Summai	ry Shee	et 1 of 1		FILE:	C:\Documents an	nd Settings\b		ack Rock\Black Rock		
PLANT ACCOUNT	PAY ITEM		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
		Estimate Worksheets	Identify One Type of Intake, Pumping	Plant		,)			
		and Discharge Line.					·			
	<u> </u>									
		Intake - Civil/Structur	PLUS DISCHARGE 1: TUNNEL/TUNN	EL. 				\$62,549,800.00		
		Intake - Mechanical/E						\$16,266,190.00		
		Plant - Civil/Structura	l Subtotal					\$74,727,300.00		
		Plant - Mechanical Su	btotal					\$162,681,500.00		
		Plant - Electrical Subtotal						\$8,171,175.00		
		Switchyard & Transm	ission Line Subtotal					\$29,730,000.00		
		Discharge 1 - Subtotal						\$248,397,650.00		
···		Subtotal	· .					\$602,523.615.00		
		Mobilization	+/-	5%				\$30,000,000.00		
		Subtotal w/ mobilizati	on					\$632,523,615.00		
		Unlisted Items	· <u>+/-</u>	10%				\$67,476,385.00 		
		CONTRACT COST						\$700,000,000.00		
		Contingencies FIELD COST	+/-	25%				\$170,000,000.00 \$870,000,000.00		
								007030003000000		
		011	ANITITIES			DE	RICES			
QUANTITIES BY CHECKED 1			Craig A. Grush Elizabeth Tran		СНЕСКЕВ	8/17/04				
DATE PREPARED PEER RI			PEER REVIEW	Elizabeth Tran DATE PREPARED 08/17/04			PEER REVIEW DED 8/17/04			

FEATURE:				PROJE	PROJECT:					
		s Intake, Pumpin eyance System	g Plant, Switchyard, and Q= 6,000 cfs		Yakima Rive	er Basin	Water Storage O	ptions		
			·	REGION	PN	PRICE	LEVEL:	Appraisal		
Intake- (Civil			FILE:			ovanotte\Desktop\Blac _6000 Rev 1.xls Sum			
PLANT ACCOUNT	PAY ITEM		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
		CIVIL								
		Construct/Remove		voir Intake						
	ŀ	i	et from shore without barge.	von attake			<u> </u>			
		†	cellular cofferdam.				†			
		 	0 feet, 32-ft dia. cells, 28 ft high	1						
	l	i	erdam - El. 488, Bottom of cofferda	m - El. 460		<u> </u>	· · · · · · · · · · · · · · · · · · ·			
		Assume top of re	ock at reservoir bottom			ĺ				
		Use same cofferdam as 3,500 option.			· 					
	<u>-</u>	Furnish and install sh	eet pile walls	D8120	555	TONS	\$2,200.00	\$1,221,000.0		
		Arbed AS 500-1	· · · · · · · · · · · · · · · · · · ·	50120	200	10115	\$2,200.00			
	2	Backfill cells with fre	e-draining granular material	D8120	11,700	CY	\$30.00	\$351,000.0		
	3	Unwater behind coffe		D8120	6	MOS	\$55,000.00	\$330,000.0		
		Assume sumps a	nd surface pumps							
		•	<u>-</u> -							
		Remove Cofferdam								
		Remove and stockpil	e granular material	D8120	11,700	CY	\$25.00	\$292,500.0		
		Extract and salvage s	- · · · · · · · · · · · · · · · · · · ·	D8120	555	TONS	\$300.00	\$166,500.0		
						· · · · · · · · · · · · · · · · · · ·				
		···								
		<u></u>								
										
								<u></u>		
					·					
								 <u></u>		
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								····		
			Chara Calana							
	i	OI	Sheet Subtotal JANTITIES	·		D	RICES	\$2,361,000.00		
BY			CHECKED	BY (A						
Dick LaFond MRC Shee			Traig A. Grush		CHECKED BOV 8	3/17/04				
PEER REVIEW			DATE PREP			PEER REVIEW	6/17/04 CD			
4/19/04					08/17/04			ED-		

FEAT	URE:			PROJE	CT:			
	•	s Intake, Pumping Pl syance System - Q=			Yakima Rive	er Basin	Water Storage O	ptions
		•		REGION	PN	PRICE	LEVEL: .	Appraisal
Intake-	Structur	ral		FILE:			bvanotte\Desktop\Blac _6000 Rev 1.xls Sumn	
F F	EM							
PLANT ACCOUNT	PAY ITEM	DES	CRIPTION	CODE	QUANTITY	TINU	UNIT PRICE	AMOUNT
<u> </u>		Structural Excavation at						
		Assume dam excavati		<u> </u>				
	<u> </u>		excavation is common and the rem	ainder is rock				
	<u> </u>		use for backfill or embankment.					
	ŀ	Excavation of common ma		D8140	458,600	CY	\$6.00	\$2,751,600.0
	·	Excavation of rock for stru		D8140	843,000	CY	\$15.00	\$12,645,000.0
		Furnish backfill for structu		D8140	43,300	CY	\$4.00	\$173,200.0
	 	Place backfill around struc		D8140	43,300	CY	Included above	
	11	Compact backfill around s	tructures	D8140	43,300	CY	\$5.00	\$216,500.0
		Roads and Fencing						
	12	Gravel surfacing			2,270	TONS	\$20.00	\$45,400.0
		20 ft wide road right s	ide of channel					
	 	12 ft wide road left sie	le of channel			İ		
	13	Safety fencing			4,750	LF	\$20.00	\$95,000.0
	Ì	8' chainlink fence						
		STRUCTURAL						
	·							
		Construct Gated Intake	and Fishscreen Structure					
	14		einforced concrete (f'c=4ksi)	D8140	56,890	CY	\$350.00	\$19,911,500.0
	+	Furnish and place concrete		D8140	9,102,400	LBS	\$0.75	\$6,826,800.0
		Furnish and handle cemen		D8140	16,050	TONS	\$110.00	\$1,765,500.0
	'0	i diman and made cemen	· · · · · · · · · · · · · · · · · · ·		10,0.70	10/13	\$110.00	- 91,700,000.0
		Construct Lined Intake (Canal					
	1.7			D0140	2.640	CV	\$250.00	#024.000.0
		Furnish, form, and place u		D8140	2,640	CY	\$350.00	\$924,000.0
		lining in excavated ch		D0140	· · · · · · · · · · · · · · · · ·	TO NO.	#1 to oo	
	10	Furnish and handle cemen	·	D8140	740	TONS	\$140.00	\$103,600.0
		Construct Bypass Pipe						
		4 - 54" Dia, steel pipe for f	ish bypass.		21,120	LF	\$330.00	\$6,969,600.0
		Mortar lined pipes						
	20	Bypass pipe common exca	vation		303,250	CY	\$5.00	\$1,516,250.0
	21	Bypass pipe rock excavation	on		159,500	CY	\$15.00	\$2,392,500.0
L	22	Bypass pipe backfill			435,700	CY	\$7.00	\$3,049,900.0
	23	Bypass pipe soil cement be	dding (100 psi)		14,590	CY	\$55.00	\$802,450.0
		Miscellaneous Metalworl	:					
Listed under Intake - Mechanical Items								
			ike - Civil/Structural Subtotal					\$62,549,800.00
			TITIES			PI	RICES	
ВҮ			CKED	ву Сл			CHECKED	
1,1	Chou Cha		David Gesundheit/Anne Pavol		Craig A. Grush	İ	CHECKED Bov	8/13/04
DATE PRI			R REVIEW	DATE PREF			PERR REVIEW -	****
	4/19/04			DATE PREPARED 08/17/04 BOV 8/17/ PEER REVIEW OS/17/04			ed	

FEATU Priest Inflow	Rapids	s Intake, Pumping	Plant, Switchyard, and Q= 6.000 cfs	PROJE	_	er Basin V	Water Storage	Options
	00,,,,	yanoo oyoto	,	REGION	PN	PRICE	LEVEL:	Appraisal
Intake- l	Mechan	rical		FILE:			vanotte\Desktop\Bl: 6000 Rev 1.xls Sun	ack Rock\Black Rock mary
PLANT	PAY ITEM		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Mechanical						
	<u> </u>	Furnish and install ste (upstream of radial ga	el stoplog guides and seats tes)	D8410	22,000	LBS	\$6.00	\$132.000.00
	2	Furnish and install ste	el trashracks	D8410_	170,000	LBS	\$4.00	\$680,000.00
	3	Furnish and install on (assume Atlas Polar D	e trash rake, rails, supports T8300 rake)	D8410	30,000	LBS	\$10.00	\$300,000.00
	4	Furnish and install one	e conveyor, steel	D8410	20,000	LBS	\$10.00	\$200,000.00
<u></u>	5	5 Furnish and install steel fish screen guides, supports, embedded seats, and bypass walls 6 Furnish and install fish screens, 10' W x14' H panel 120 panels + 6 spares		D8410	623,000	LBS	\$4.00	\$2,492,000.00
· · · · · · · · · · · · · · · · · · ·	6			D8410				
		Structural steel Stainless steel			177,000 177,000	LBS	\$4.00 \$15.00	\$708,000.00 \$2,655,000.00
	7	Furnish and install bar 10' W x 11' H panels, Structural steel	rier panels above fish screens 120 panels + 6 spares	D8410	347,000	LBS	\$4.00	\$1,388,000.00
	8	Furnish and install adj		D8410				
		Structural steel			945,000	LBS	\$4.00	\$3,780,000.00
	9	8 systems with 2 brust a. Structural steel b. Stainless steel	a screen cleaners with travel rail, a cleaner arms per system educers, with adj. speed	D8410	64,000 4,000 8	LBS LBS UNITS	\$4.00 \$20.00 \$5,000.00	\$256,000.00 \$80,000.00 \$40,000.00
	10	Furnish and install wa	ter level measuring systems	D8410	17	UNITS	\$11,000.00	\$187,000.00
			Sheet Subtotal					\$12,898,000.00
		Ql	JANTITIES			Р	RICES	
BY CHECKED R Christensen/B Sund		ву (Traig A. Grush		CHECKED SØ√8/	17/04		
DATE PR 4/21/2004		· · · · · · · · · · · · · · · · · · ·	PEER REVIEW	Array Array BOV8/17/04			ED-	

	Rapid		ing Plant, Switchyard, and	PROJE		er Basin	Water Storage O	ptions		
Inflow	Conve	eyance System	- Q= 6,000 cfs	REGION	I DNI	Innier	T I TO KIND I			
				FILE:		•		Appraisal		
intake-	Mechai	nical		112			\bvanotte\Desktop\Blac ^_6000 Rev 1.xls Sumn			
PLANT	PAY ITEM		DESCRIPTION	СОДЕ	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
		Mechanical (cont)			<u> </u>			<u></u>		
	11	Furnish and install (downstream of fish	steel stoplog guides and seats h screens)	D8410	22,000	LBS	\$6.00	\$132,000		
	12	Furnish and install different size bays	one set of steel stoplogs for the two with lifting beam	D8410	167,000	LBS	\$4.00	\$668,000		
	13	3' wide walkway, s	teel, safety grating alng fish screens	D8410	33,000	LBS	\$7.00	\$231,000.		
	14	Handrail along each	h side of fish screen walkway	D8410	2,560	LF	\$50.00	\$128,000.0		
		Radial Gates in In	take Structure							
	ļ	T	four 36.5-ft x 8.5-ft top seal	D8420		ļ				
	15	radial gates and hoi Gate (Weight/gates		-	138,600	 1 BS	\$8.00	\$1,108,800.0		
			ork (Weight/bay= 5,000 lbs)		20,000		\$5.00	\$1,100,000.0		
	1	t:	ight/gate operator= 11,300 lbs)		45,200		\$20.00	\$904,000.0		
···	t	Motor - 5 hp (One	<u> </u>			EA	Included in opera			
							-	·		
<u></u>								···		
					· · ·					
										
					<u>-</u>					
							- · · · · · · · · · · · · · · · · · · ·	·		
										
			• •••							
·	Sheet Subtotal						\$3,271,800.0			
		C	UANTITIES			P	RICES			
Ry		nsen/B Sund (D8410) an (D8420)	CHECKED Am R	BY (raig A. Grush		CHECKED <i>COV</i>	8/17/04		
DATE PREPARED PEER REVIEW		DATE PREP				26.				
5/12/04			<u> </u>		08/17/04					

	Rapid		g Plant, Switchyard, and	PROJE		er Basin	Water Storage	Options
Inflow	Conve	eyance System -	Q= 6,000 cfs					
				REGION	PN	PRICE	LEVEL:	Appraisal
<u> </u>	Electric	al		FILE:	C:\Documents a Revisions\(Pries	nd Settings\ st Rapids PP	ovanoue\Desktop\Bla _6000 Rev 1.xls]Sun	ack Rock\Black Rock mary
PLANT	PAY ITEM	3	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		ELECTRICAL						
		Service Equipment (F&I)	D8430		<u> </u>		
	19	Distribution panelboa		20.50	1	EA	\$25,000.00	\$25,000.0
			e with 225 ampere bus			1271	\$25,000.00	\$25,000.0
		, voo vone, e pina				1		·
	20	Outdoor transformer	nad center		1	EA	\$11,000.00	\$11,000.0
	1 -		, 480-240/120 volt				\$11,000.00	\$11,000.00
		TO X 113, 2 pinns	, 100 210/120 (01			 	· · · · · · · · · · · · · · · · · · ·	
		Combination Motor	Starters	D8430				_
	21	NEMA size 2 non-rev		20.00	6	EA	\$8,000.00	\$48,000.00
		480-120 volt control t				D. I	ψο,οσο.οσ	\$40,000.00
	1	NEMA type 4 enclosu						
		- Contrasper Concress						_ .
	 	Insulated Conductor	s (F&I)	"				
		600-volt, single-condu				· · · · · ·		· -
	22	12 AWG	vici, business copper	1 1	500	I F	\$0.60	\$300.00
	23			1	200		\$0.70	\$140.00
	24	8 AWG		1 1	100		\$1.00	\$100.00
		011110			100		\$1.00	\$100.00
		Conduit System (F&	<u>r)</u>					 .
		Rigid steel conduit						* ** ***
	25	T		···-	150	I F	\$15.00	\$2,250.00
		1 111011			150		\$15.00	\$2,230.00
		Lighting System (F&	I)	D8430				
	26	High-pressure soc	lium, pole mounted, outdoor		6	EA	\$1,600.00	\$9,600.00
		70 watt, 120 volt						
			·					
			Intake - Mechanical/Electrical Sub	ototal				\$16,266,190.00
		QL	ANTITIES			PF	RICES	
ВҮ	Mike Sch	րե	CHECKED L Row	BY J	Gr.: Hizabeth Tran		CHECKED BOV	8/17/84
DATE PR			PEER REVIEW			1,	PEES BEVIEW	
	5/6/04			DATE PREPARED 08/17/04 CHECKED 00/ 8/17/1			led	

FEATI Priest		s Intake Pumpino	g Plant, Switchyard, and	PROJE		Basin W	/ater Storage C)ptions
		yance System -						
				REGION	PN	PRICE	LEVEL:	Appraisal
Plant- C	ivil					_	ranotte\Desktop\Bla 5000 Rev 1.xls]Sum	ick Rock\Black Rock imary
PLANT ACCOUNT	РАУ ІТЕМ		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
<u> </u>]					L		
	1	Access Road (9.75 m	iles of 2-lane access road):					
	Ī	Assume construc	t access road from SH24 to PP.	<u> </u>				
		Assume place roa	d along abandoned railroad alignment			<u></u>		
	T	Assume no major	excavation or embankment sections.].				
	ı	Clear roadway alignm	ent	D8140	45	AC	\$3,500.00	\$157,500.00
	2	Furnish and place base	e course material (9-inch depth)	D8140	96,000	TONS	\$16.00	\$1,536,000.00
	3	Furnish and place aspl	halt concrete (6-inch dcpth)	D8140	70,000	TONS	\$60.00	\$4,200,000.00
	4	Furnish and install W-	beam type guardrait	D8140	10,000	LF	\$25.00	\$250,000.00
	5	Furnish and install mi	scellaneous pipe culverts	D8140	1,000	LF	\$200.00	\$200,000.00
	<u> </u>		diameter, wt/ft= 35#/ft)					
		Service Yard (6" asp	halt concrete surface)				1	<u> </u>
	6	Strip and clear pumpir	ng plant site to 1 foot depth	D8120	15,300	CY	\$3.00	\$45,900.00
	7 Common excavation to Service Yard El. 505.0		o Service Yard El. 505.0	D8120	164,000	CY	\$5.00	\$820,000.00
	8	Rock excavation to Se	ervice Yard El. 505.0	D8120	208,000	CY	\$15.00	\$3,120,000.00
	9	Place and compact em	bankment for service yard	D8120	19,200	CY	\$8.00	\$153,600.00
			e course material (6-inch)	D8120	10,000	TONS	\$20.00	\$200,000.00
	1	Furnish and place aspl		D8120	11,000	TONS	\$80.00	\$880,000.00
	12	Furnish and install 7-f	oot chain link fence for PP Yard	D8120	3,100	LF	\$20.00	\$62,000.00
	13	Furnish and install 7-f	oot x 24-foot access gate	D8120	3	EA	\$3,500.00	\$10,500.00
			34					
	···	Dewatering During (Assume no groun	dwater flows into excavation.	ĺ				
	ļ	Structural Excavatio						
			on material excavated under site excavation	n for yard.				
	ļ	Assume stockpile	rock for later use as riprap or rockfill.					
	14	Exeavation of rock for	structures (drill & shoot)	D8120	 248,400 .	CY	\$15.00	\$3,726,000.00
	ł l		ructures (assume local borrow)	D8120	44,300	CY	\$4.00	\$177,200.00
	·	Place backfill around s		D8120	44,300	CY	Included above	•
	1	Compact backfill arou		D8120	44,300	CY	\$5.00	\$221,500.00
	+		d pipe to edge of Service Yard	D8120	102,400	CY	\$15.00	\$1,536,000.00
	1		pact backfill for manifold pipe trench(assu		83,200	CY	\$9.00	\$748,800.00
			ement for manifold pipe trench	D8120	10,700	CY	\$55.00	\$588,500.00
	ļ 		Sheet Subtotal					\$19 623 500 00i
	QUANTITIES (7)				PA	RICES	\$18,633,500.00	
BY	Dick LaF		CHECKED R. C.	ву /			CHECKED	
-	M.R. O'Shea M.R. O'Shea M.R. O'Shea M.R. O'Shea M.R. O'Shea		_	Dig A. Grush		60V	8/17/04	
DATE PR			PEER REVIEW	DATE PREP			PEER REVIEW	27.10.2.1
	4/19/04				08/17/04			VEN-

Priest	FEATURE: Priest Rapids Intake, Pumping Plant, Switchyard, and nflow Conveyance System - Q= 6,000 cfs		PROJECT: Yakima River Basin Water Storage Options						
Пшон	Oomes	yanda dystem - di- ojosa sia	REGION	PN	PRICE I	LEVEL:	Appraisal		
Plant- S	Structura	l£		C:\Documents and : Revisions\ Priest R:			ack Rock\Black Rock		
PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
		STRUCTURAL							
	t			<u> </u>		Ĺ			
		Construct Building Structure		111.200	<u> </u>	*250.00	777 172 200 0		
		Furnish, form, and place reinforced concrete	D8120	111,800	1 1	\$350.00			
- "	22	Purnish and place concrete reinforcement. Assume 110 #/CY	D8120	12,298,000	LBS	\$0.75	\$9,223,500.00		
	23	Furnish and handle cement (.282T/CY)	D8120	31,530	TONS	\$110.00	\$3,468,300.00		
 	<u> </u>	Furnish & install precast, prestressed double tees for roof		<u> </u>		 			
<u> </u>	24		D8120	45	EA.	\$50,000.00	\$2,250,000.00		
				<u> </u>		···			
			——————————————————————————————————————						
<u> </u>	 				<u> </u>	1			
<u> </u>				l					
		Structural Steel				****	±555 000 0		
	25	Furnish and install structural steel (painted): crane rails, baseplates	D8120	68,000	LBS	\$4.00	\$272,000.00		
		crane rails, basepraids							
<u> </u>	<u> </u>	Miscellaneous Metalwork							
<u></u>	26	Furnish and install miscellaneous metalwork	D8120	250,000	LBS	\$7.00	\$1,750,000.00		
<u> </u>		Includes gratings, hatches, ladders, guardrails,		<u> </u>	[]	 			
		catwalk, and cable trays and supports			 	<u> </u>	 		
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<u>.</u>			+		, <u> </u>	<u></u> J	-		
		Plant - Civil/Structural Subtotal					\$74,727,300.00		
		QUANTITIES			PR	ICES			
ВҮ	M. R. O'	Shea CHECKED		Graig A. Grush	(CHECKED <i>60</i> V	/ 8/19/04		
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FEATURE: Priest Rapids Intake, Pumping Plant, Switchyard, and Inflow Conveyance System - Q= 6,000 cfs				Yakima River Basin Water Storage Options							
Inflow	Conve	eyance System +	Q= 6,000 cfs	REGION	PN	PRICE	LEVEL:	Appraisal			
Plant - N	lochan	ical		FILE: C:\Documents and Settings\bvanotte\Desktop\Black Rock\Black Rock Revisions\Priest Rapids PP_6000 Rev 1.xls\Summary							
PLANT ACCOUNT	PAY ITEM	icai	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT			
		Major Mechanical E	l uipment								
		Pump prices below tel	ephone quote from Bob Rittase, Voith H	ydro, 717-792	-7206						
			ral case pump, rated 1000 cfs at 1430 ft erall efficiency more than 83%								
		operating range 1030 t			6	EA	\$9,000,000.00	\$54,000,000.00			
	2		lves, with operators, rated at 1500 ft		6	EA	\$4,500,000.00	\$27,000,000.00			
 	3 4		2000 ft surge pressure, with operators n of 1000 cfs pumping unit		6	EA EA	\$4,500,000.00 \$1,500,000.00	\$27,000,000.00			
		FURNISII-AND-INS	TALL THE FOLLOWING:								
		Steel Manifold and S Steel plate used for pi		D8420							
·			50: Sy = 50 kpsi								
	5	(All pipe sizes are in: 264" Dia., 4.8125" wa			4,450,000	LBS	S2.00	\$8,900,000.00			
	6	264" Dia., 4.625" wall	, L= 540 ft.		7,200,000	LBS	\$2.00	\$14,400,000.00			
	7	248" Dia., 4.5" wall, L	= 110ft.		1,350,000	LBS	\$2.00	\$2,700,000.00			
	8	170" Dia., 1" wall, L=			1,550,000	LBS	\$2.00	\$3,100.000.00			
	9	222" Dia., 4" wall, L= 192" Dia., 3.5" wall, L		<u> </u>	1,020,000	LBS	\$2.00 \$2.00	\$2,040,000.00 \$1,320,000.00			
	11	110" Dia., 2 " wall, L=			1,200,000	LBS	\$2.00	\$2,400,000.00			
	12	157 Dia., 2.875" wall,			445,000	LBS	\$2.00	\$890,000.00			
	<u>-</u> -										
			Sheet Subtotal					\$152,750,000.00			
	·	QL	ANTITIES			F	RICES				
		ву С	Taig A. Grush		CHECKED	8/17/04					
DATE PREPARED 5/6/04				DATE PREP			PEER REVIEW DCD				

FEATURE: Priest Rapids Intake, Pumping Plant, Switchyard, and Inflow Conveyance System - Q= 6,000 cfs		PROJECT: Yakima River Basin Water Storage Options						
Intiow (COLIVI	eyance System - Q= 0,000 cis	REGION	PN	PRICE	LEVEL:	Appraisal	
Plant - N	/lechar	nical	FILE:	:\Documents an Revisions\[Pricst	d Settings\bva Rapids PP_60	anotte\Desktop\Black Rock\Black Rock 000 Rev 1.xts Suramary		
PLANT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT	
		Mechanical (cont)						
		CONTRICT Description Surface	D-8410	2	each	\$100,000.00	\$200,000.00	
	13	CO2 High Pressure Fire Extinguishing System: 16 - 100# Storage Cylinders w/ control panel	- 15-0410		Cacin	3100,000.00	4200,000.00	
	<u> </u>	and appurtenances and 2,500 lbs. of	-		 			
		sch. 80 carbon steel pipe, valves & fittings	 					
	-	self, ou carbon seet [n]e, varies to mange			<u> </u>			
	14	Fire Suppression System:	D-8410		L.S.		\$225,000.00	
		12 Fire hose reels w/ 100 feet of hose						
		24 - Portable hand-held 20# extinguishers						
	<u> </u>	13,000 lbs. of sch. 40 carbon steel pipe, valves & fittings						
		1 - Fire pump, split-case, 500 gpm @ 300 ft of head						
			D 0410				5275 000 00	
	15	Unit Cooling Water System:	D-8410	!	L.S.		\$275,000.00	
	L	7 - Cooling water pumps, end-suction type, 150 gpm				·		
		2 - 8-inch automatic, self-cleaning strainers					···	
	ļ	5,000 lbs. of type K copper tubing, valves & fittings					·	
		6,000 lbs. of ductile iron, mechanical joint pipe & fittings	ļ					
	16	Lubricating Oil System:	12-8410	··· -	L.S.		\$60,000.00	
		2- 500 gal carbon steel storage tanks						
	† · · · · · · · · · · · · · · · · · · ·	1 - 10 gpm @ 100 psi oil pump						
		I - lube oil filter						
	<u> </u>	4,000 lbs. of sch. 40 carbon steel pipe, valves & fittings						
					1			
	17	Compressed Air System:	D-8410	1	L.S.		\$110,000.00	
	 	2 - 100 cfm @ 125 psi rotary screw air compressors						
		1 - 250 gal, carbon steel air receiver						
		1 - 200 cfm air dryer				-		
		4,000 lbs. of sch. 40 carbon steel pipe, valves & fittings						
		1.1						
· · ·	18	Service Water System:	D-8410	1	L.S.	-	00.000,0112	
		1 - Service water pump, 75 gpm @ 200 ft. of head						
		I - Hydropneumatic Tank, 300 gal.						
	ļ 	2,000 lbs. of type K copper tubing, valves & fittings						
			}	-				
	19	Gravity Drainage System:	D-8410	1	L.S.		\$350,000.00	
	ļ	60 - Floor drains, cast iron					· · · · · · · · · · · · · · · · · · ·	
		35,000 lbs. of cast iron hub & spigot, service weight			++			
	 	soil pipe Sheet Subtotal	1				\$1,330,000.00	
		QUANTITIES			P	RICES	\$1,550,000.00	
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	John Gr	1 4	-	Taig A. Grush		BI	0V 8/12/04	
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FEATURE: Priest Rapids Intake, Pumping Plant, Switchyard, and			PROJECT: Yakima River Basin Water Storage Options						
	nflow Conveyance System - Q= 6,000 cfs			PN		LEVEL:	Appraisal		
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Plant - I	Mechan	ical				runotte\Desktop\Black Ro 000 Rev 1.xts Summary	CKYRIACK KOCK		
PLANT ACCOUNT	РАҮ ПЕМ	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
-		-							
		Mechanical (cont)				<u></u>			
	20	Plant Unwatering System:	D-8410		L.S.		\$200,000.00		
		2 - Vertical turbine type sump pump, 1000 gpm @ 50 ft hd	1,50,110						
-	 		-						
	 	1 - Drainage jet type drainage pump							
<u> </u>		1,500 lbs. of type K copper tube, valves & fittings			ļ ·	-			
	 	4,000 lbs. of ductile iron, mechanical joint pipe & fittings				 			
	21	Domestic Water and Sanitary Waste System:	D-8410		L.S.		\$100,000.00		
		4 - Water Closets							
	 	2 - Urinal			 	1			
		4 - Lavatories & accessories					- · · · · · ·		
<u> </u>	 -					 · · · · ·			
		1 - Duplex Sewage Ejector	}-				-		
ļ		2,000 lbs. of east iron hub & spigot service weight							
ļ —	 	sewer pipe							
		800 lbs. of type K copper tubing, valves & fittings							
<u> </u>									
							 		
						·			
	22	100-Ton overhead cranc, 72'-6" span	D8410	153,000	LBS	\$6.00	\$918,000.00		
	\	700 your orange, 72 o span		,		,,,,,			
	23	200-Ton overhead cranc, 72'-6" span, two required	D-8410	520,000	LBS	\$6.00	\$3,120,000.00		
	24	Electric traction elevator	D8410	1	unit	\$500,000.00	\$500,000.00		
		overhead, geared, capacity = 3500 pounds,			<u> </u>				
	<u> </u>	travel = 100 feet, landings = 6, speed = 200 ft/min.							
	25	Ultrasonic flowmeter, 4-path	D8410	1	meter	\$35,000.00	\$35,000.00		
 		Ontabone now need, 4-pain	D0410		inotor	\$53,000.00	ψ3.5,000.00		
	26	Trashracks (steel) at pumping plant	D8410	106,000	LBS	\$4.00	\$424,000.00		
	27	Stoplogs, lifting beam, seats and guides (steel)	D8410	33,000	LBS	\$4.00	\$132,000.00		
	┼	(assumes one bay of stoplogs and 6 bays of guides)	-						
<u> </u>	-						· · · · · · · · · · · · · · · · · · ·		
						 			
	· · · · · · · · · · · · · · · · · · ·								
ļ	Sheet Subtotal					<u> </u>	\$5,429,000.00		
		QUANTITIES			F	PRICES			
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PLANT ACCOUNT	РАУ ПТМ	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT			
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			+	.	-		+			
	 	Mechanical (cont)	+		 					
-		2 V - Waters and Air Conditioning	D-8410	1	L.S.	 	\$3,172,500.00			
	 	Heating, Ventilating, and Air Conditioning HVAC for bulding except bus & switchgear	D-0-10	-	Lay.		Ψ211			
	 		+		-					
		459-ft long by 77'-ft wide by 70-ft high unit/service bay			 	 				
<u> </u>		54-ft long by 77-ft wide by 20-ft high control bay								
ļ		Two each 54-ft long by 77-ft wide by 17-ft equipment rooms	+	 	+					
-	ļ	393-ft long by 56'-ft wide by 20-ft high Electrical Gallery	·		·	 				
<u> </u>		Pump/Motor/Valve Galleries= 756,000 ft^3	+				 			
	 		+							
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	<u> </u>	Plant - Mechanical Subtotal			<u> </u>	<u> </u>	\$162,681,500.00			
		QUANTITIES	<u> </u>		P	PRICES				
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FEATURE: Priest Rapids Intake, Pumping Plant, Switchyard, and Inflow Conveyance System - Q= 6,000 cfs		I	PROJECT: Yakima River Basin Water Storage Options							
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Plant-Ele	ectrical									
PLANT ACCOUNT	PAY ITEM		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
		Plant Grounding Syst	tem (F&I)	D8430						
	1	Ground rods, 10 ft	, 3/4" dia., copper-clad		55	EA	\$180.00	\$9,900.0		
		Stranded bare-cop	per conductor			ļ				
	2	250 MCM			1,600	 	\$5.50	\$8,800.0		
	3	4/0 AWG			1,200	+	\$4.00	\$4,800.0		
	4	2/0 AWG			1,000	LF	\$3.50	\$3,500.0		
	5	4 AWG			700	<u>LF</u>	\$2.50	\$1,750.0		
			(T.O.Y.)				_			
		Motor Bus & Switchs		D8430			dr. 500.00	#2 000 000 0		
··· ·	6	Main motor isolated-pl			600	LF	\$6,500.00	\$3,900,000.0		
		1	peres; 3-phase; 60 hz.							
		Self-cooled								
	<u></u>	Individual motor isolat	ed-phase bus:							
	7	15 kV; 7,000 amp	eres; 3-phase; 60 hz.		300	LF	\$2,000.00	\$600,000.0		
	<u> </u>	Self-cooled								
						Ì				
	1									
	l ———	Motor reduced-voltage	, static starting system with			Ī				
		15 kV, SF6 type unit c	ircuit-breakers							
	8	<u> </u>	s continuous current		6	EA	\$275,000	\$1,650,000.00		
	 					··				
		Motor Control Equip	ment (F&I)	D8430						
	9		poard for operation of 6 main		l I	EA	\$250,000	\$250,000.00		
	 	pumping motors.	Avaid for Operation of O main	·	.*.		4250,000	Q230,000.00		
		pumping motors.								
	 									
	<u> </u>						· · · · · · · · · · · · · · · · · · ·			
		Motors						·		
		Listed under Plant	-Mechanical							
		. <u> </u>								
Sheet Subtotal							\$6,428,750.00			
		QU	ANTITIES			Pi	RICES			
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FEATURE: Priest Rapids Intake, Pumping Plant, Switchyard, and		PROJE	PROJECT: Yakima River Basin Water Storage Options					
		yance System - (
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PLANT ACCOUNT	PAY ITEM		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
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				· · · -				
								
		15 kV Metal-Clad Sw	itchgear (F&I)	D8430				
	10	<u> </u>	chgear rated 1200 amperes with]	EA	\$350,000	\$350,000.0
			um type power circuit breakers					
						ļ <u>.</u>		
		15 kV Non-Segregate	d-Phase Bus (F&I)	D8430		ļ		
	11	15 kV, 1200 amperes			300	FT	\$800.00	\$240,000.00
						<u> </u>		
				D0430				
		Plant Station-Service		D8430				
		following features:	econdary unit substation with					l
	12		mer 13.8 kV-480Y277 V, 2,500 KVA		7	EA	\$90,000.00	\$180,000.0
	13		it breakers, 600 amperes			EA	\$4,500.00	\$54,000.0
	1,5		in oreakers, doe amperes		12	****	\$1,500.00	\$51,000.0
								
		Building Lighting Sys	stem (F&I)	D8430			T.	
		Interior luminaires	·-····					
	14	High bay, high-pro	essure sodium, 400 W, 480 V		38	EA	\$700.00	\$26,600.00
	15	Emergency lighting sy	stem		1	LS		\$900.00
	16	Exterior luminaires			14	EA	\$400.00	\$5,600.00
			ium, wall mounted, outdoor					
		70 watt, 120 volt						
								-
							l	
								<u> </u>
Sheet Subtotal						\$857,100.00		
	QUANTITIES				Р	RICES		
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	Mike Sch		<u> </u>		Elizabeth Tran		SOV PEER REVIEW	-/-//-
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	5/6/04				08/17/04		<u> </u>	

FEATURE: Priest Rapids Intake, Pumping Plant, Switchyard, and			PROJECT: Yakima River Basin Water Storage Options						
Inflow (nflow Conveyance System - Q= 6,000 cfs			73.7	l	* ***			
			REGION	PN	PRICE	LEVEL:	Appraisal		
Plant-Ele	ectrical					bvanotte\Desktop\Blac _6000 Rev 1.xlsJSumn			
PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
-									
	17	Building Fire Detection and Alarm System (F&I)	D8430		LS		\$150,000.0		
		The Hard Born Hard Control of the Co		4	EA	\$80,000.00	\$320,000.0		
	18	Distribution Panelboards (F&I) 480 volts, 3-phase with 400 ampere bus	D8430	4	EA		\$320,000.0		
		450 voits, 3-priese with 400 ampere bus							
	19	Motor Control Centers (F&I)	D8430	2	EA	\$150,000	\$300,000.0		
		480 volts, 3-phase with 1200 ampere bus							
		Six 20 inch wide sections							
	<u>-</u>								
		Insulated Conductors (F&I)	D8430						
		600-volt, single-conductor, stranded copper			<u></u>				
	20	14 AWG		12,000	}	\$0.50	\$6,000.0		
	21	12 AWG		15,500		\$0.55	\$8,525.0		
	22	10 AWG		15,500	· · · ·	\$0.70	\$10,850.0		
	23				LF	\$1.50	\$4,500.0		
	24	 		·	LF LF	\$1.75	\$5,250.0		
	25	1/0 AWG		2,000	Lr	\$2.75	\$5,500.0		
		600-volt multi-conductor control cable							
	26	9 conductor 16 AWG		2,500	LF	\$1.25	\$3,125.0		
	27	ļ		3,500	LF	\$1.50	\$5,250.0		
	28	5 conductor 10 AWG		3,500	LF	\$1.75	\$6,125.0		
		Conduit System (F&1)	D8430						
		Rigid steel conduit							
	29			1,000	1	\$14.00	\$14,000.00		
	30			600	1	\$22.00	\$13,200.00		
	31	2 1/2 inch		350	f	\$30.00	\$10,500.00		
	32	3 inch		250	LF	\$42.00	\$10,500.00		
		Plastic-coated rigid steel							
	33	2 inch		400	LF	\$30.00	\$12,000.00		
		Plant - Electrical Subtotal					\$8,171,175.00		
		QUANTITIES			Р	RICES			
ВҮ	Mike Sch	CHECKED L Rom'	BY C	J for: Mizabeth Tran		CHECKED BOJ	8/17/04		
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	FEATURE: Priest Rapids Intake, Pumping Plant, Switchyard, and				PROJECT: Yakima River Basin Water Storage Options						
		eyance System -				·					
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PLANT ACCOUNT	PAY ITEM		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT			
		STRUCTURAL		D8120							
	†	 	ard structures covered under	 - -		 -					
		unlisted items.				 					
						<u> </u>					
		ELECTRICAL									
<u>-</u>		Switchyard	· · · · · · · · · · · · · · · · · · ·								
		Furnish and Install:									
	1		vator-type power transformer	D8440	3	EA	\$7,000,000	\$21,000,000.00			
	<u>.</u> .	873 MVA; 500-1	3.8kV, 1-phase			<u> </u>	-				
	2	500-kV disconne	ect switches, 1200 amp, 3-phase	D8440	4	EA	\$125,000	\$500,000.00			
	3	500-kV circuit br	reakers, 1200 amp, 3-phase	D8440	2	EA	\$1,115,000	\$2,230,000.00			
	-										
	4	Construct Transmiss	sion Line	D8440	6	MILES	\$1,000,000	\$6,000,000.00			
			of transmission line from				7-,,				
		Midway substatio	on to the east								
_		<u> </u>	vers, 2167 AWG conductor								
		A									
								<u>-</u>			
		<u> </u>				-					
			Switchyard & Transmission Line Su	ubtotal				\$29,730,000.00			
			JANTITIE\$				RICES				
BY 1 L. Gamuciel	R. LaFond llo (D8440		CHECKED	BY GE	Elizabeth Tran		CHECKED BOV	8/17/04			
DATE PRE	PARED		PEER REVIEW	DATE PREP	ARED	j	BOV PEER REVIEW	121			
	5/6/04		James R. Zeiger (D8440)		08/17/04		N ²				

FEATURE: Priest Rapids Intake, Pumping Plant, Switchyard, and			PROJECT: Yakima River Basin Water Storage Options						
Inflow Col Tunnel/Tun	•	em - Q= 6,000 cfs	REGION	PN	Ippici	E LEVEL:	Approisal		
DISCHARG	·		FILE:	C:\Documents and	Settings\t		Appraisal ck Rock\Black Rock		
PLANT ACCOUNT DAVITEM	_	DESCRIPTION	CODE	QUANITITY	UNIT	UNIT PRICE	AMOUNT		
		inel 50-ft long, 22.00-ft finished diameter, 25.00-ft TBM and driven uphill. Water problems will					c		
i	- Jokea valled William	7 Seri and arrest approximately problems will		united has times	111141 34	pport reaches.			
	32,150-ft long t Excavation	unreinforced concrete lined reach (appr. 18 cy/lf)	D-8140	32,150	lf	\$2,400.00	\$77,160,000.0		
	2 Furnish and	d place unreinforced concrete tunnel lining	D-8140	132,000	cy	\$350.00	\$46,200,000.0		
	3 Cementitio	us materials for concrete tunnel lining	D-8140	37,200	tons	\$100.00	\$3,720,000.0		
	4 Furnish &	install 1-in dia, 10-ft long rock bolts	D-8140	266,000	lin ft	\$50.00	\$13,300,000.0		
	1,000-ft long re 5 Excavation	inforced concrete lined reach (appr. 18 cy/lf)	D-8140	1,000	If	\$3,000.00	\$3,000,000.0		
	6 Furnish and	d place reinforced concrete tunnel lining	D-8140	4,100	 су	\$350.00	\$1,435,000.0		
	7 Cementitio	us materials for concrete tunnel lining	D-8140	1,160	tons	\$120.00	\$139,200.0		
	8 Furnish and	install concrete reinforcement	D-8140	64,400	lbs	\$1.00	\$64,400.0		
	9 Furnish and	install structural steel tunnel supports	D-8140	738,000	Ibs	\$4.00	\$2,952,000.0		
- <u>-</u>	1,700-ft long sto	eel lined portal reach		·			 .		
	10 Excavation		D-8140	1,700	lf	\$3,000.00	\$5,100,000.0		
	Steel Tunnel Lin	ner: 72 Gr. 50: Sy = 50 kpsi St = 65 kpsi							
to		" wall, L= 1700 ft., 13,281 lbs/ft	D-8420	22,577,700	LBS	\$2.00	\$45,155,400.0		
	[1] Furnish and	place backfill concrete	D-8140	6,970	су	\$300.00	\$2,091,000.00		
	12 Cementition	us materials for backfill concrete	D-8140	1,970	tons	\$130.00	\$256,100.00		
	13 Furnish & i	nstall 1-in dia, 10-ft long rock bolts	D-8140	9,800	lin ft	\$60.00	\$588,000.00		
	14 Furnish and	install structural steel tunnel supports	D-8140	738,400	Ibs	\$4.00	\$2,953,600.00		
		Sheet Subtotal					\$204,114,700.00		
		QUANTITIES			PF	RICES			
	hompson (D8140) Frisz (D8420)	CHECKED KA (DEMC)	ву С	L Gz : raig A. Grush		CHECKED BO	8/17/04		
	ATE PREPARED PEER REVIEW 4/19/04			DATE PREPARED 08/17/04 PEER REVIEW ORD ORD ORD ORD ORD ORD ORD OR					

	FEATURE:			PROJECT:						
		ds Intake, Pumping Plant, Switchyard, and reyance System - Q= 6,000 cfs		Yakima River	Basin W	Vater Storage O	ptions			
	/Tunnel		REGION	N PN	PRICE	E LEVEL:	Appraisal			
DISCHA	ARGE1	i	FILE:			vanotte\Desktop\Blac 6000 Rev 1.xls Sumn				
	Τ.]						
PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT			
		Construct Surge Shaft								
	!					!				
<u> </u>	ļ'	Construct 1506-ft deep, 22.0-ft finished diameter, 24.34-ft min	··· ··· - · · · · · · · · · · · · · · ·				[
<u> </u>	'	excavated by raise bore and drill down method. Water problem	ms will be may	nimal. Shart nas	s two tina	al support reache	<u> </u>			
l		1,200-ft deep unreinforced concrete lined reach	<u> </u>	· · · · · · · · · · · · · · · · · · ·	 	+	· · · · · · · · · · · · · · · · · · ·			
<u> </u>	15		D-8140	1,200	lf	\$6,000.00	\$7,200,000.0			
	16	6 Furnish and place unreinforced concrete shaft lining	D-8140	3,800	су	\$350.00	\$1,330,000.0			
	17	7 Cementitious materials for concrete shaft lining	D-8140	1,070	tons	\$130.00	\$139,100.0			
	18	Furnish & install 5/8-in dia, 6-ft long rock bolts	D-8140	63,100	lin ft	\$50.00	\$3,155,000.00			
 					<u> </u>					
	19	300-ft long reinforced concrete fined shaft top reach Excavation (appr. 17 cy/lf)	D-8140	300	lf	\$6,000.00	\$1,800,000.0			
	20	Furnish and place reinforced concrete shaft lining	D-8140	945	су	\$400.00	\$378,000.00			
	21	Comentitious materials for concrete shaft lining	D-8140	265	tons	\$160.00	\$42,400.00			
	22	Purnish and install concrete reinforcement	D-8140	15,700	lin ft	\$1.00	\$15,700.00			
	23	Furnish & install 5/8-in dia, 6-ft long rock bolts	D-8140	15,600	lin ft	\$50.00	\$780,000.00			
			-		·	<u> </u>				
	24	Furnish and install chain link protection	D-8140	13,000	sq yd	\$20.00	\$260,000.00			
	Ī						·			
	Ī	<u> </u>	1							
		<u> </u>					·			
	 -		+ +							
	Sheet Subtotal QUANTITIES						\$15,100,200.00			
BY		CHECKED KA	ву С	 		CHECKED	_			
I	Bill Thomp	првоп	d	L for Craig A. Grush		CHECKED <i>[50 r</i>	1 8/19/04			
DATE PRE	5/5/04	PEER REVIEW	DATE PREPA	PARED 08/17/04	P	PEER REVIEW	Red			

FEAT	URE:			PROJE	£CT:			
Priest	t Rapid:		ing Plant, Switchyard, and - Q= 6,000 cfs	:		: Basin W	Vater Storage O	Iptions
	i/Tunnel	•	·· .	REGION	N PN	PRICE	LEVEL:	Appraisal
	-	•		FILE-		-	vanotte\Desktop\Blac	1
	IARGE1	· · · · · · · · · · · · · · · · · · ·				-	6000 Rev 1.xls Sumn	
PLANT ACCOUNT	PAY ITEM		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		For Tunnel only in	nlet - For 6000 cfs from Priest Rapids				-	
	T -	Assume ~100' h	head to valley invert and L~ 4000'	1		<u> </u>	,	
	l	Quantities for the	the 6000 cfs flow are scaled up				·	
ĺ						ļ'		
		Earthwork				<u> </u>		
	ļ	f · ·	of the 3500 cfs option unless otherwise:	shown			<u> </u>	·
	25	- · · · · · · · · · · · · · · · · · · ·		D8130	55,000	CY	\$15.00	\$825,000.0
	··· 1·			D8130	337,700		\$5.00	
	1 -	-		D8130	1,650	1	\$15.00	\$24,750.0
i	28	8 Furnish and place Zo	Conc 3 bedding for pipe	D8130	26,400		\$40.00	\$1,056,000.0
Ϊ	29	9 Backfill pipe with ex	excavated material	D8130	260,700		\$7.00	\$1,824,900.0
·	Assume ~100' head to valley Quantities for the 6000 cfs flo from the 3500 cfs option. Earthwork Assume 110% of the 3500 cfs 25 Excavation at outlet area for portal 26 Excavation for pipe trench 27 Excavation for thrust block 28 Furnish and place Zone 3 bedding 29 Backfill pipe with excavated mater 30 Furnish and place zone 3 bedding 31 Furnish and place riprap (120%) Concrete 32 Concrete for open channel (150%) 33 F & P reinforcement (160 lbs/CY) 34 Furnish and handle cement (.282T/ 35 Concrete for thrust block (170%) 36 F & P reinforcement (100 lbs/CY) 37 Furnish and handle cement (.235T/	one 3 bedding for riprap (120%)	D8130	6,000	-	\$40.00	\$240,000.0	
				D8130	12,000	-	\$35.00	\$420,000.0
Ĺ		Concrete	·		<u> </u>		<u> </u>	
<u> </u>	32	2 Concrete for open channel (150%)		D0130	750		2120.00	7722 800 (
i"'				D8130 D8130	750 120 000	+	\$400.00	\$300,000.0
ı'		· · · · · · · · · · · · · · · · · · ·		D8130 D8130	120,000 210	LBS TONS	\$1.00 \$160.00	\$120,000.0 \$33,600.0
T		Pulluan	ement (.20%1/C.1)	Dorre	·	TOING	\$160.00	\$33,600.0
· · · · · · · · · · · · · · · · · · ·	1			D8130	1,700	CY	\$400.00	\$680,000.0
· 1	1			D8130	170,000	LBS	\$1.00	\$170,000.0
!	37	Furnish and handle o	ement (.235T/CY)	D8130	400	TONS	\$160,00	\$64,000.0
		Steel Pipe						
1	38		. = 4000' t= 3/4 inches	D8130	10,186,000	LBS	\$2.00	\$20,372,000.0
- !		Wt/ft + 10% for	r couplings and connections					West, and a second
)	[]	(wt/ft = 2315 lbs)	es/ft)					
/		Furnish and install sto		D8410	135,000	LBS	\$4.00	\$540,000.0
·	40	Furnish and install ste	eel bulkhead	D8410	206,000	LBS	\$4.00	\$824,000.00
	41	Remove and salvage	_ <u> </u>	D8410	9,167,400	LBS	N/A	
	Ī	Assume diver-ass	ssisted removal in wet at a max					
	<u> </u>	depth = 100'.				,		
1	1		of 90% of the pipe.	†		. — .		·
	Ĺ	Assume lift bags	s to raise pipe and harge-mounted			,		
	<u> </u>	crane to handle p	pipe at surface.					
	4 -		on (quote), but salvage value is					
	1		he cost to remove and cut up pipe.	<u> </u>				
		0	Discharge 1 - Subtotal					\$248,397,650.00
	o _{to} .	- 6 1	UANTITIES				ICES	
	-	ensen (D8410)	CHECKED AND	BY (J. For		CHECKED 501 87	1 mint
DATE PRE		· · · · · · · · · · · · · · · · · · ·	PEER REVIEW	DATE PREPA		P	501 87 PEER REVIEW	- N
	5/7/04		1		08/17/04	I	ρι	20-

Black Rock Dam and Reservoir Large Reservoir Active Storage= 1.3 MAF

Field Cost Estimate

FEATURE: Black Rock Dam and Reservoir Yakima River Basin Water Storage Options				Options			
Large R	eservo	ir - Active Storage= 1.3 MAF	REGION FILE:	PN	·	LEVEL:	Appraisal
Summa	ry She	et 1 of 3 WOID = YAKEN		C:\Documents a Revisions\ Blac	nd Settings\\ k Rock Dam	ovanotte\Desktop\E _1.3MAF Rev 1.xl	Black Rock\Black Rock s Summary
PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Estimate Worksheets Identify Three Dam Types Dam Type 1: Concrete-Faced Rockfill Dam					
		Dam Type 2: Central-Core Rockfill Dam Dam Type 3: Roller Compacted Concrete Dam					
·		DAM TYPE 1: CONCRETE-FACED ROCKFILL Includes foundation treatment, dam structure, river outlet works, and relocation of State Highway 24.					
		Dam'i Subtotal			<u> </u>		\$774,496,000.00
		River Outlet Works (ROW1) Subtotal					\$83,494,115.00
		Relocation of State Highway 24 (SH24) Subtotal					\$57,320,000.0
		Subtotal		·			\$915,310,115.0
		Mobilization 5% (+/-)		<u> </u>		\$46,000.000.00
		Subtotal w/ mobilization					\$961,310,115.0
	··	Unlisted Items 10% (+/-) 				\$88,689,885.0
	- -	DAM TYPE 1: CONTRACT COST		· · · · · · · · · · · · · · · · · · ·			\$1,050,000,000.0
<u></u> .		Contingencies 25% (+/-	<u> </u>				\$250,000,000.00
		DAM TYPE 1: FIELD COST					\$1,300,000,000.00
	_						
			<u> </u>				
		QUANTITIES			F	PRICES	<u> </u>
BY		CHECKED	BY	D. Donaldson	<u> </u>	arra arran	8/17/21
DATE PI	DATE PREPARED PEER REVIEW		DATE PREPARED 08/17/04 CHECKED CHECKED CHECKED CHECKED CHECKED CHECKED CHECKED CHECKED CHECKED CHECKED CHECKED CHECKED CHECKED CHECKED CHECKED CHECKED CHECKED CHECKED COV S 13/ dat CHECKED CHECK			(Jus prolot	

FEATURE: Black Rock Dam and Reservoir			PROJE		an Basin 1	Vater Storage	Ontions	
Black F	łock L	Jam and Reserve	oir		Yakima Kiv	er dasm v	vater Surage	Options
Large Re	eservo:	ir - Active Storage=	1.3 MAF	REGION	PN	PRICE I	LEVEL:	Appraisal
- I								Hack Rock\Black Rock
Summar	y Shee	et 2 of 3	WOID = YAKEN		Revisions\ Blac	k Rock Dam	1.3MAF Rev 1.xl	s Summary
PLANT ACCOUNT	PAYITEM		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		DANGER A. CEL	ATTENDATE CODE BOCKELL	<u></u>				
			ion treatment, dam structure,			-		
			s, and relocation of State Highway 24	1.		 		<u> </u>
		11101 Odder work	a, mic retocation of Education 1	···				
		Dam2 Subtotal						\$733,280,000.00
		River Outlet Works (ROW1) Subtotal					\$83,494,115.00
		Relocation of State F	fighway 24 (SH24) Subtotal					\$57,320,000.00
		·						
		Subtotal			· · · · · · · · · · · · · · · · · · ·			\$874,094,115.00
		Mobilization	59	% (+ /-)				\$44,000,000.00
-		Subtotal w/ mobiliza	tion					\$918,094,115.00
		Unlisted Items	109	% (+/-)		·		\$81,905,885.00
						-		
		DAM TYPE 2: COM	NTRACT COST			 		\$1,000,000,000.00
		Contingencies	259	% (+/-)				\$250,000,000.00
		DAM TYPE 2: FIE	LD COST					\$1,250,000,000.00
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ı.				·		<u> </u>		
						 		
		· · · · · · · · · · · · · · · · · · ·				1		
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	ļ		<u></u>		 			
	<u>t</u>	, O	UANTITIES		L. <u>.</u>	F	RICES	
BY			CHECKED	BY	D. Donaldson		CHECKED St	V 8/17/04
DATE PR	EPAREI)	PEER REVIEW	DATE PRE			PEER REVIEW	1 . 1 . 1 . 4
				DATE PREPARED 08/17/04 PEER REVIEW 08/17/04				

FEATURE: Black Rock Dam and Reservoir				۲	HOJE		an Bacin Y	Water Storage	Ontions		
Black F	10CK L	Jam and Heservo	IF			i akima Kiv	er dasin '	water Storage	—————————————————————————————————————		
Large Re	eservoi	r - Active Storage= 1	.3 MAF	R	EGION	PN	PRICE	LEVEL:	Appraisal		
Summar	y Shee	et 3 of 3	WOID = YAKEN	F	ILE:	C:\Documents a Revisions\[Blac	nd Settings\\ k Rock Dam	ovanotte\Desktop\I _1.3MAF Rev 1.xl	Black Rock\Black Rock ls]Summary		
PLANT ACCOUNT	РАҮ ІТЕМ		DESCRIPTION		CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
						···	<u> </u>				
		•	LER COMPACTED CONCRETE On treatment, dam structure,	<u> </u>							
			, and relocation of State Highway 2	4.			<u> </u>				
		With Mariet Works	, who is the same is a sam			·					
		Dam3 Subtotal					ļ		\$1,239,036,300.00		
							-		\$23,384,515.00		
		River Outlet Works (R	(OW2) Subtotal						\$23,364,5 <u>13.00</u>		
		Relocation of State Hi	ghway 24 (SH24) Subtotal						\$57,320,000.00		
						· · -					
		<u> </u>							\$1,319,740,815.00		
		Subtotal		-+			 		\$1,519,740,613.00		
		Mobilization	55	% (+/-)					\$66,000,000.00		
		Subtotal w/ mobilizati	on						\$1,385,740,815.00		
		Unlisted Items		 % (+/-)		· .			\$114,259,185.00		
	<u></u>	Offisied fields		/// / 			 		411,120,100,00		
· 		DAM TYPE 3: CON	TRACT COST						\$1,500,000,000.00		
		Contingencies	259	% (+/-)			 		\$400,000,000.00		
		DAM TYPE 3: FIEL	D COST						\$1,900,000,000.00		
	ļ	<u> </u>									
			· · · · · ·				1		-		
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	<u> </u>						<u> </u>		-		
	QUANTITIES						F	RICES			
BY CHECKED		B.	Y 1	D. Donaldson		CHECKED /	SOV 8/13/04				
DATE PREPARED PEER REVIEW		DATE PREPARED 08/17/04 DATE PREPARED 08/17/04 PEER REVIEW 08/17/04		1 . (alan							
					08/17/04				Vos Bliston		

FEATURE: Black Rock Dam and Reservoir		LHONE						
				· ·	Yakima River	Basin W	Vater Storage O	ptions
-		oir - Active Storage= 1.		REGION	PN	IPRICE	LEVEL:	Appraisal
Dam ry	pe 1.	Concrete-Faced Rock	fill Dam	7777 12-				•
Dam 1 -	- Civil/s	Structural			C:\Documents and Revisions\ Black '	. Settings\bv Rock Dam_	vanotte\Desktop\Blac 1.3MAF Rev 1.xls S	ck Rock\Black Rock Summary
	L	T		1				
PLANT ACCOUNT	PAY ITEM		DESCRIPTION	CODE	QUANTITY	UNIT	UNITERICE	AMOUNT
AC	P.A			\perp	<u> </u>	 		
					 -	-	- -··	
	<u> </u>	GENERAL SITEWO		 	——	1 -	 	<u> </u>
	ļ		ng and grubbing required	1	Į 	-		<u> </u>
			rovements and haul roads are			-		
		part of unliste	ed items			l		
	<u> </u>	TOTAL O TABLE		+	i	-	<i>,</i> -	
<u> </u>		DIVERSION & DEW		-	· ·	1		.
	1		ater is below excavation		ı			
	 	Assume natural st	treum beds in area are dry	+		-		
ļ -		TOTAL PROPERTY.	CARLA COLONIA		i		+	
		FOUNDATION EXC				· · · · · ·	+	
			material stockpiled for reuse			 	·	
	Assume rock material stockpiled for reuse Stockpiles will be upstream, within 1/2 mile of dam			+		+		+
<u> </u>	-	Stockpues war or	upstream, within 1/2 mile of dain	+ +		·	+	
	ļ	1 Excavation, stripping,	-f.d.— Foundation	D8312	360,000	CY	\$2.00	\$720,000.00
	+ ,		stripping 12 inches or less	D05.2		<u> </u>	**	₩, 251
	+		will be stockpiled for topsoil use			+		+
	-			D8312	26,640,000	CY	\$3.00	\$79,920,000.00
		2 Excavation, common, for dam foundation Assume about 35% of volume requires ripping		10000	20,010,0	\ \tag{2}	******	W17,7
· · · · -	-	·· · · · · · · · · · · · · · · ·	% of valume requires ripping ned and coarse-grained materials	+	 I	+	+	
 								-
			dam foundation	D8312	2,000	CY	\$45.00	\$90,000.00
 	-	3 Excavation, rock, for d	blast in random locations	استندون	<u> </u>	- C 1		Ψνοισοίου
<u> </u>		Assume arm arm	blast in random tocations		<u></u>	+	+	
<u> </u>	-	FOUNDATION TRE	S & TEMPENT			+	 	
	+		undation treatment, fault zone	+			+	+
			undation treatment, fauit zone lidation grouting, and curtain grouting		1	-	· -	
 	+	Нештен, соизон	dation grouing, and curium growing	+ +	 		+	
	+	Miscellaneous Found	dation Arnae			+	1	1
			of poor quality rock	+ +			+	†
ļ	 	прина тысы	у рост дишиу госк	" ""	<u> </u>	+	 	
		4 Slush grouting of foun	adation curface	D8312	165,000	SF	\$2.00	\$330,000.00
	+		% of area between ws toe and axis				<u> </u>	
 		5 Dental concrete	10 Of Great Defreces was see	D8312	2,000	CY	\$150.00	\$300,000.00
<u> </u>	· 	6 Furnish/place zone 2 si	eand filter on foundation	D8312	40,000	 -	\$28.00	\$1,120,000.00
ļ	+	-	% of area between ws toe and axis	+		-	*	*-
		Assume a 3-ft thic		1		†	 	
 	+ ,	· · · · · · · · · · · · · · · ·	gravel drain on foundation	D8312	40,000	CY	\$25.00	\$1,000,000.00
ľ		** **	ilter in a 3-ft thickness				T	<u> </u>
		Dam1 Subtotal			··			\$83,480,000.00
			JANTITIES	T		PF	RICES	
BY			CHECKED	BY I	D. Dopaldson		CHECKED	
Will Genz	zales	!	Bill Engemoen		DCD_		BOI	V 8/17/04
DATE PR		.D	PEER REVIEW	DATE PREP	PARED		PEER REVIEW	W 8/17/04
4/12/2004			Bill Engemoen		08/17/04			Marghan.

FEATURE:			PROJECT:					
		Dam and Reservoir	·	Yakima River	Basin W	ater Storage Op	ptions	
		ir - Active Storage= 1.3 MAF	REGION	PN	PRICE I	LEVEL.	Appraisal	
Dam Ty	pe 1: C	Concrete-Faced Rockfill Dam	EII E.				* *	
Dam1 -	Civil/St	ructural				motte\Desktop\Black .3MAF Rev 1.xls{St		
PLANT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT	
		FOUNDATION TREATMENT (continued)						
		Treatment of south abutment fault area						
	8	Extra rock excavation for fault treatment	D8312	150,000	CY	\$13.00	\$1,950,000.0	
		Assume south abutment is fractured						
		Assume excavate with hydraulic excavator						
		Dental concrete for fault treatment	D8312	5,000	CY	\$140.00	\$700,000.00	
	10	Furnish/place zone 2 sand fifter downstream of plinth	D8312	55,000	CY	\$28.00	\$1,540,000.00	
	Assume a 3-ft thickness, 500' by 1000' area							
		Assume same source as listed under embankment						
	11	Furnish/place zone 3 gravel drain d/s of plinth	D8312	55,000	CY	\$25.00	\$1,375,000.00	
		Assume 3-ft thickness, over zone 2 filter						
	<u></u>	Consolidation Grouting of Foundation						
		Generally limited to area beneath plinth						
1	12	Setups for drilling grout holes	D8312	4,400	EA	\$75.00	\$330,000.00	
		Assume 2-inch dia. drilled on 7.5-foot centers						
i	13	Drill grout holes D8312 132,000 LF \$1		\$15.00	\$1,980,000.00			
	<u> </u>	Assume 2-inch dia. wAength= 30 feet						
	14	Hookups to grout holes	D8312	4,400	EA	\$60.00	\$264,000.0	
	15	Pressure grout	D8312		CF	\$7.00	\$1,400,000.00	
		Assume grouting process only minus cement						
		Assume 2 CF per 1 LF of hole	<u> </u>			 		
	16	Furnish and handle cement for pressure grouting	D8312	200,000	BAGS	\$8.00	\$1,600,000.00	
	ļ	Assume 1 bag per CF						
		Curtain Grouting of Foundation						
	····	Two-row curtain beneath plinth						
	 17	Setups for drilling grout holes	D8312	1,400	EA	\$100.00	\$140,000.00	
		Assume 2-rows of 2-inch dia.on 10-ft centers					, , , , , , , , , , , , , , , , , , , ,	
	18	Drill grout boles	D8312	275,000	LF	\$15.00	\$4,125,000.00	
	<u> </u>	Assume 2-inch dia. w/length from 60 to 250 feet						
	19	Hookups to grout holes	D8312	1,400	EA	\$75.00	\$105,000.00	
	20	Pressure grout	D8312	550,000	CF	\$7.00	\$3,850,000.00	
		Assume grouting process only minus cement						
		Assume 2 CF per 1 LF of hole		·				
	21	Purnish and handle cement for pressure grouting	D8312	550,000	BAGS	\$8.00	\$4,400,000.00	
		Dami Subtotal				ICEC	\$23,759,000.00	
<u></u>		QUANTITIES	_			ICES		
BY Will Gonz	ales	CHECKED Bill Engemoen	BY I	D. Donaldson		CHECKED BOV	8/9/04	
DATE PR			DATE PREP	<u></u>		PEER REVIEW	<u> </u>	
4/12/2004		Bill Engemeen	PALPIRE	08/17/04		PEER REVIEW (LAA 31104)		

I		PROJE	:CI:				
		Dam and Reservoir		Yakima River	Basin V	Vater Storage O	ptions
		ir - Active Storage= 1.3 MAF					
Dam Ty	rpe 1: (Concrete-Faced Rockfill Dam	REGION	PN	PRICE	LEVEL:	Appraisal
Dam1 -	Civil/St	ructural	FILE:		l Settings\bvanotte\Desktop\Bl Rock Dam_L3MAF Rev Lxls		
F 5	EM						1
PLANT ACCOUNT	PAYHEM	DESCRIPTION	CODE	QUANTITY	UNII	UNIT PRICE	AMOUNT
		EMBANKMENT CONSTRUCTION			-l	<u> </u>	<u> </u>
		Items are set up as furnish and place, which would				 	
 	 	include purchasing from commercial sites,			ļ	 	<u></u>
-		processing onsite, development of quarry, or					
		transporting from stockpiles of required excavation					
						ļ	
	22	Furnish and place zone 1 upstream blanket	D8312	900,000	CY	\$6.00	\$5,400,000.0
		Consists of loess stockpiled from required exc					
 	ļ	within 1/2 mile of dam			ļ	<u> </u>	
		Compaction to 6-inch lifts by tamping roller				<u></u>	
	23	Furnish and place zone 2 filter	D8312	1,420,000	CY	\$25.00	\$35,500,000.0
	ļ	Sand/gravel material processed commercially or developed onsite					
	1	If commercial, assume 17 mile one-way haul					
·		Compacted to 12-inch layers by vibratory steel drum					
	24	Furnish and place zone 3 drain	D8312	1,420,000	CY	\$23.00	\$32,660,000.0
		Gravel/cobble material processed commercially or		, ,,,,,,			
		developed onsite					
		If commercial, assume 17 mile one-way haul					
		Compacted to 12-inch layers by vibratory steel drum					·
	25	Furnish and place zone 4 rockfill	D8312	64,500,000	CY	\$6.50	\$419,250,000.0
		Developed from basalt ridges surrounding reservoir	1 - 32 1 -	0.,200,000		4.5.20	4111,200,000
		Assume average 1-mile haul to dam					
		Rock sizes up to 3-foot				 	
		Compacted in 3-ft layers by vibratory steel drum				1	
	26	Furnish and place zone 5 coarse grained random fill	D8312	14,800,000	CY	\$4.00	\$59,200,000.0
		Comes from stockpiles of required excavation		,,			
	†	within 1/2 mile of dam					
r	İ	Generally consists of gravelly soits					····
		Compacted in 2-ft layers by vibratory steel drum					
	27	Furnish and place zone 6 fine grained random fill	D8312	6,900,000	CY	\$4.50	\$31,050,000.00
		Comes from stockpiles of required excavation	· ····	, ,		<u> </u>	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
		within 1/2 mile of dam					
		Generally consists of sands/silts/clays					
		Compacted to 9-inch layers by tamping rollers					
						<u></u>	
							
		Daml Subtotal					\$583,060,000.00
		QUANTITIES			PF	ICES	
ВҮ		CHECKED	ву з	D. Donaldson		CHECKED	
Will Gonza	iles	Bill Engemoen		DEN		Bo	V 8/17/04
DATE PRI	EPARED		DATE PREI	- N 7		PEER REVIEW	1.4 . 1.18
4/12/2004			DATE PREPARED 08/17/04 CHECKED CAN 8/17/1 PEER REVIEW 08/17/04				Ma 811/0,

FEATURE: PROJECT:							
		Dam and Reservoir		Yakima River	Basin W	ater Storage O	ptions
, T		ir - Active Storage= 1.3 MAF	REGION	PN	DDICE	LEVEL:	AiI
Dam Ty	pe i: c	Concrete-Faced Rockfill Dam	FILE:				Appraisal
Dam1 -	Civil/St	ructural	I IDD.			anotte\Desktop\Bla L3MAF Rev 1.xls]S	ek Rock\Black Rock Summary
12 H	ſЕМ						
PLANT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		CONCRETE FACE & PLINTH CONSTRUCTION			-		
	ļ	Plinth					
		Typical thickness will be 1.5 feet				ļ	
	-	Width will range from 10 to 50 feet			ļ .		ļ
		Grouted anchors may be needed in poor rock areas			<u> </u>		<u> </u>
	28	Furnish and place reinforced concrete in plinth	D8312	11,000	CY	\$350.00	\$3,850,000.0
L	29	Furnish and place concrete reinforcement (100#/CY)	D8312	1,100,000	LBS	\$0.80	\$880,000.0
	30	Furnish and handle cement for concrete (.282T/CY)	D8312	3,100	TONS	\$120.00	\$372,000.0
	31	Furnish and install grouted anchors	D8312	300,000	LF	\$15.00	\$4,500,000.0
	l	Assume 1-inch diameter rebar grouted into rock				l	
		Assume 15-foot lengths			<u> </u>		:
		Concrete Deck	[i ,			
		Will vary in thickness from 1 to 2 feet					
	Adjacent panels will have waterstops and dow						
	22	Emails and standard formal manufactions and	De212	105.000	CV	#200 oo	
		Furnish and place reinforced concrete in deck	D8312	185,000	CY	\$300.00	\$55,500,000.0
	I	Furnish and place concrete reinforcement (100#/CY) Purnish and handle cement for concrete (.282T/CY)	D8312 D8312	18,500,000 52,200	LBS TONS	\$0.75 \$100.00	\$13,875,000.00 \$5,220,000.00
		Turnish and handle center for concrete (-2021/CT)	100312	32,200	10143	\$100.00	\$3,220,000.00
		MISCELLANEOUS	-				······
		Instrumentation					
		Assume part of unlisted items					·· -··-
		Toe Drains					
	[Assume part of unlisted items					
		Ctd. alaman and adapted and					-
<u></u>		Site cleanup and relandscaping Assume part of unlisted items					
		памине разгод инимециены	1				
		<u> </u>	<u> </u>				·
	[
		Dam 1 Subtotal QUANTITIES			DE	ICES	\$84,197,000.00
PV		· · · · · · · · · · · · · · · · · · ·	DV.	D. D	-	· .	
BY Will Gonza	iles	CHECKED Bill Engemoen	BY	D. Dopaldson		CHECKED Ear	1 8/17/01,
DATE PRI			DATE PRE	PARED		PEKR REVIEW	2 4 1
4/12/2004			DATE PREPARED DATE PREPARED OS/17/04 CHECKED BOV 8/17/01, PEER REVIEW OM 8/17/04				Unin Bliston

FEATURE: Black Rock Dam and Reservoir			PROJE					
					Yakima River	Basin W	Vater Storage C)ptions
-		ir - Active Storage= 1		2=01011	D3.7	Lanzon		
Dam Ty _l	pe 2: 0	Central -Core Rockfill	Dam	REGION	PN	PRICE	LEVEL:	Appraisal
Dam2 - 1	Civil/St	ructura!					vanotte\Desktop\Bla 1.3MAF Rev 1.xls 5	ick Rock\Black Rock Summary
	I	Tuoran		1	Revisionalizares	T	1.5.vizar Rev Transp	Зиппагу
PLANT ACCOUNT	PAY ITEM		DESCRIPTION	CODE	QUANTITY	UNII	UNIT PRICE	AMOUNT
				1		+		
		GENERAL SITEWO	ORK	1		1	 	
			ng and grubbing required	1 1		†		
	 		rovements and haul roads are			1	1	†
		part of unlist		† †			1	
	 	Pwit sy massi	ER HEALD	† †		·		
	ļ.———	DIVERSION & DEV	WATERING.	+ +		+	 	
			ater is below excavation	.		-	+	+
	 -		tream beds in area are dry	+		 	·	
		Assume natural si	tream beas in area are ary			+	+	+
.	ł	TOTAL ATION EVO	TARTA TOTANT					
		FOUNDATION EXC		+		ł		
	ł		material stockpiled for reuse	+		_		
	<u> </u>	· -	erial stockpiled for reuse			<u> </u>	 	
	ļ	Stockpiles will be	upstream, within 1/2 mile of dam				-	
-	ļ ,	Excavation, stripping,	of dam foundation	D8312	370,000	CY	\$2.00	\$740,000.00
	 	 		71.00	3/0,000	C,	φ2.00	9/40,000.00
	ļ		stripping 12 inches or less	+ +		 		
	ļ		will be stockpiled for topsoil use			 _	#2.00	
		Excavation, common,		D8312	27,130,000	CY	\$3.00	\$81,390,000.00
			% of volume requires ripping			ļ	-	
	L		ned and coarse-grained materials	1				
		· 	ately stockpiled	1 1				
	3	Excavation, rock, for c		D8312	5,000	CY	\$32.00	\$160,000.00
ļ		Assume drill and i	blast in random locations					
	 	COLORDA TROM THE	NA TRIN MEDILITEI	+ +			 	<u> </u>
		FOUNDATION TRE						
	1	•	indation treatment, fault zone			 		
; -	<u></u>	trealment, consoli	idation grouting, and curtain grouting	+		<u> </u>	1	
	 	Miscellaneous Found	lation Areas	+			 	
	 	 	of poor quality rock					
		прушения и ска	у рин чашиу тоск	+ +		 	 	
	$\vdash \vdash_{\scriptscriptstyle 4}$	Slush grouting of foun	relation surface	D8312	165,000	SF	\$2.00	+
			% of area beneath zone I	100312	103,000	31	φ2.00	\$330,000.00
-		Dental concrete	% of area veneam zone 1	120212	5 000	 	\$150.00	6750 000 00
			1 Ctan Coundation	D8312	5,000	CY	\$150.00	\$750,000.00
	١		and filter on foundation	D8312	40,000	CY	\$28.00	\$1,120,000.00
			between zone 1 and d/s toe	.			 	
	ļ <u>_</u>	Assume a 3-ft thic.		+		ļ	l <u></u>	
		·	gravel drain on foundation	D8312	40,000	CY	\$25.00	\$1,000,000.00
	ł		lter in a 3-ft thickness	· • • • • • • • • • • • • • • • • • • •				
		Dam 2 Subtotal	IANTITIES	<u></u>		D.E	I RICES	\$85,490,000.00
				 				
BY Will Consu			CHECKED	ВУ Г	D. Donaldson		CHECKED	V Klark
Will Gonza			Bill Engemoen	<u> </u>	THU IX		200	V 10/13/37
DATE PRI	EPARED		PEER REVIEW	DATE PREP			So PEER REVIEW). 4 dalo4
4/12/2004			Bill Engemoen		08/17/04	:	<i>''</i>	The Dir

FEATURE: Black Rock Dam and Reservoir		PROJE	_				
				Yakima River	. Basin W	/ater Storage O	ptions
-		oir - Active Storage= 1.3 MAF				****	. ,
Dam 1y _i	pe 2: ι	Central -Core Rockfill Dam		P N	PRICE	LEVEL:	Appraisal
D <u>am2 -</u>	Civil/St	tructural			_	•	
ρĶ	EM						į
PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
_ ∢:	Δi ,				<u> </u>	 	
!	<u> </u>		!	ļ	 	-	
ł		FOUNDATION TREATMENT (continued)		 	 '		
!	 	Treatment of south abutment fault area	- ·	· · · · · · · · · · · · · · · · · · ·	 '		
	1	Treatment of south abutment fault area Extra rock excavation for fault treatment	D8312	150,000	. /	\$20.00	\$3,000,000.0
			D0312	150,000	100	\$20.00	\$3,000,000.0
J		Assume south abutment is fractured Assume excavate with hydraulic excavator		t	+	 	
		Assume excavate with hydraulic excavator Dental concrete for fault treatment	7 20212	5,000	!	\$140.00	\$200 000 C
!	· • · · · · · · · · · · · · · · · · · ·	Dental concrete for fault treatment		+		\$140.00	1
	10,	Furnish/place zone 2 sand filter downstream of zone 1	FILE: CADocuments and Settings/byanotte/Desktop Revisions\Black Rock Dam_1.3MAF Rev 1. CODE QUANTITY UNIT UNIT PRICE D8312 150,000 CY \$20 D8312 55,000 CY \$28 D8312 55,000 CY \$25 D8312 180,000 EA \$75 D8312 180,000 EA \$60 D8312 270,000 EA \$60 D8312 270,000 EA \$60 D8312 1,400 EA \$100 D8312 1,400 EA \$15 D8312 1,400 EA \$75	\$28.00	\$1,540,000.00		
	 '	Assume a 3-ft thickness, 500' by 1000' area	-		 	 	
		Assume same source as listed under emb.		55,000	 /	225.00	
	111	Furnish/place zone 3 gravel drain d/s of zone 1	D8312	55,000	CY ,	\$25.00	\$1,375,000.00
!	\!	Assume 3-ft thickness, over zone 2 filter		1	1 . 1		<u></u>
	!	Consolidation Grouting of Foundation	+		-		
		<u> </u>		f 🖖	+ 1		
	1	Generally limited to area beneath zone 1		4 nno		P75.00	
!	141	Setups for drilling grout holes Assume 2 inch dia drillad on 10 foot centure	D8512	0,000	EA	\$15,00,	\$450,000.00
!		Assume 2-inch dia. drilled on 10-foot centers	D8312 6,000 EA \$75.00 oot centers D8312 180,000 LF \$15.00 eet		77.700.000.0		
	ادا	3 Drill grout holes	D8312	180,000	LF)	\$15.00	\$2,700,000.00
!	<u> </u>	Assume 2-inch dia. w/length= 30 feet	.	·	\bot	<u> </u>	<u> </u>
'	1	Hookups to grout holes			000 EA \$60.00		\$360,000.00
. !	157	Pressure grout	D8312 J	270,000	[CF]	\$7.00	\$1,890,000.00
	1'	Assume grouting process only minus cement		Ĺ <u></u> '		L!	<u> </u>
/		Assume 2 CF per 1 LF of hole				· ·	
	16	Furnish and handle cement for pressure grouting	D8312	270,000	BAGS	\$8.00	\$2,160,000.00
	1 !	Assume I bag per CF		i'	1	l!	
				·		[<u>.</u> _!	
	['	Curtain Grouting of Foundation	<u> </u>			[
		Two-row curtain beneath zone 1		ı!		· · · · · · · · · · · · · · · · · · ·	
1	[17]	Sctups for drilling grout holes	D8312	1,400	EA	\$100.00	\$140,000.00
	[Assume 2-rows of 2-inch dia.on 10-ft centers	<u> </u>	,		ı <u> </u>	<u> </u>
	18	Drill grout holes	D8312	275,000	LF	\$15.00	\$4,125,000.00
	1	Assume 2-inch dia. w/length from 60 to 250 feet		, , , ,		(
	19	Hookups to grout holes	D8312	1,400	EA	\$75.00	\$105,000.00
		Pressure grout			1 1	\$7.00	\$3,850,000.00
	f)	Assume grouting process only minus cement					<u> </u>
J	[Assume 2 CF per I LF of hole		,		,	· ·
	21	Furnish and handle cement for pressure grouting	D8312	550.000	RAGS	\$8.00	\$4,400,000.00
	[]	Assume 1 bag per CF	1	,	BACC	φυ.υ	D+,+00,000.0
		Assume 1 bug per vir		,	f	i	·
	f : 1	Dam 2 Subtotal				<i>i</i>	\$26,795,000.00
	<u></u>	QUANTITIES			PR	ICES .	\$40,720,000 occ
BY		CHECKED	nv.	Idean	Ī,	CHECKED	
BY Will Gonzal	£4.,		В). Donaldson	ľ	CHECKED &O	of alialah
		Bill Engemoen	- Company	Hen-	\longrightarrow		1 81:40-1
DATE PRE 4/12/2004			DATE PREA		ľ	PEER REVIEW	/ M _1.7/04
4112004		Bill Engemoen		08/17/04	ı	· W	J'' 911''

FEATURE:			PROJECT:						
		Dam and Reservoir			Yakima River	Basin W	ater Storage O	ptions	
-		ir - Active Storage= 1.3 N							
Dam Ty	рө 2: (Central -Core Rockfill Dar	n	REGION	PN	PRICE	LEVEL:	Appraisal	
Dam2 -	Civil/\$t	ructural		FILE:		_	anotte\Desktop\Blac I.3MAF Rev [.xls]S	k Rock\Black Rock ummary	
PLANT ACCOUNT	Mati ya	DESC	CRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT	
		EMBANKMENT CONST	TRUCTION						
			nish and place, which would				<u> </u>		
		include purchasing fro				<u> </u>	† · · ·		
		processing onsite, dev							
ï		-	kpiles of required excavation						
		<u>.</u>							
	22	Furnish and place zone 1 co		D8312	9,000,000	CY	\$8.50	\$76,500,000.0	
		Acquired from source							
		Compacted to 6-inch l	····—	D0210	1 200 000		#25 00	#3.4.G50.000.0	
	23	Furnish and place zone 2 fi		D8312	1,390,000	CY	\$25.00	\$34,750,000.0	
		or developed onsi	processed commercially					···	
		If commercial, assume							
			layers by vibratory steel drum					<u> </u>	
	24	Furnish and place zone 3 de		D8312	1,390,000	CY	\$23.00	\$31,970,000.0	
			l processed commercially or	D6512	1,390,000		\$23.00	0.000,079,164	
— ·· ·		developed onsite	processed commercially or						
		If commercial, assume	17 mile one-way haul						
			layers by vibratory steel drum						
	25	Furnish and place zone 4 re		D8312	58,700,000	CY	\$6.50	\$381,550,000.00	
			ridges surrounding reservoir				1,0.00		
		Assume average I-mile					[·	
		Rock sizes up to 3-foot	· ·· ··						
		Compacted in 3-ft laye	rs by vibratory steel drum						
	26	Furnish and place zone 5 co	oarse grained random fill	D8312	15,000,000	CY	\$4.00	\$60,000,000.00	
		Comes from stockpiles	of required excavation						
		within 1/2 mile of	dam						
		Generally consists of g							
		Compacted in 2-ft laye	rs by vibratory steel drum					<u></u>	
	27	Furnish and place zone 6 fix		D8312	8,050,000	CY	\$4.50	\$36,225,000.00	
			of required excavation					<u>.</u> .	
		within 1/2 mile of							
		Generally consists of sa							
		Compacted to 9-inch le	yers by tamping rollers					<u></u>	
					<u> </u>			·	
									
		Dam 2 Subtotal						\$620,995,000.00	
	QUANTITIES					PR	ICES	\$020,550,000.00	
ву	·	CHE	CKED	BY I	D. Donaldson				
Will Gonzal	les		ngemoen		DOD	ĺ	BOV	8/11/04	
DATE PRE	PARED	-	REVIEW	DATE PREP	ARED	······································	PEER REVIEW		
4/12/2004	f .			DATE PREPARED 08/17/04 CHECKED BOL 8/7 PEER REVIEW			Jus slator		
								31/	

FEATURE:		,	PROJECT:						
Black Rock Dam and Reservoir Large Reservoir - Active Storage= 1.3 MAF Dam Type 2: Central -Core Rockfill Dam				!	1	Yakima River	r Basin W	Vater Storage O	Options
				!			-		
Dam ıy	/pe 2:	Central -Core носки	fill Dam	!	REGION	N PN	PRICE	LEVEL:	Appraisal
	Misce	ellaneous			FILE:	C:\Documents and Revisions\[Black	Settings\bv Rock Dam_	vanotte\Desktop\Blac 1.3MAF Rev 1.xls[S	ick Rock\Black Rock Summary
PLANT ACCOUNT	ITEM			I		1			
ACC A	PAY ITEM	1	DESCRIPTION	!	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	+-						+	-	
	+	MISCELLANEOUS	IS .				+	-	
<u> </u>	1		<u></u>		 	1			-
	†	Instrumentation	<u></u>						+ ·· ·
	<u></u>	Assume part of u	unlisted items		[]			<u> </u>	,
						Ī			<u> </u>
	<u></u>	Toe Drains				1			
		Assume part of u	unlisted items		Ī	<u> </u>			<u> </u>
		<u> </u>							
	-	Site cleanup and rel				 	<u> </u> '		
 		Assume part of u	unlisted items		 	i	 '	<u>-</u>	
						_			
		-		<u> </u>	 	Γ			ļ
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	<u> </u>								
		<u> </u>							
				<u> </u>					
		Dam 2 Subtotal							\$0.00
		<u> </u>	UANTITIES					ICES	
BY			CHECKED	R	BY D	D. Donaldson		CHECKED	
Will Gonzal			Bill Engemoen			Ded		PEER REVIEW	V 8/17/04
DATE PRE		,	PEER REVIEW	D	DATE PREPA		F	PEER REVIEW	7 4 11-164
4/12/2004 Bill Engemoen						08/17/04	Dr. Bur		

	EATURE:		PROJECT:					
		Dam and Rese oir - Active Storag			Yakima Rive	r Basin '	Water Storage	Options
		_	l Concrete (RCC) Dam	REGIO	N PN	PRIC	E LEVEL:	Appraisal
Dam3 -	Civil/S	tructural		FILE:	C:\Documents an	d Settings\\		lack Rock\Black Rock
F 2	E				TO THE MENT OF THE PARTY OF THE	TOOK Dain	_1.5.6.4.1.4.6	Journary
PLANT ACCOUNT	PAY ITEM		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		General Sitework	k		<u> </u>		"	<u> </u>
	ĺ	Clear and Grub re	servoir area (not required)			1		T
<u>.</u>		Roads, haul roads	, instrumentation, site cleanup and		T			
		relandscaping	g included in unlisted items			Ţ		
··· ·		Diversion/Dewat	ering during Construction			+	 	
<u> </u>		Assume grou	ndwater is below excavation.		-	Ţ· ·		
		Assume natur	ral stream beds in area are dry.		<u> </u>	<u> </u>		
		Foundation Exca	vation and Backfill	-	 i	-	 	
	<u></u>	Strip topsoil a	and stockpile for reuse					T
	<u></u>	Assume stock	pile common material for backfill		_	1		-
		Assume stock	pile rock material for riprap and crosion p	rotection		Ī		
		Assume drill	and shoot rock for tunnels in ROW	{			ļ	
		foundation	on excavation			-	ļ	
	 	Materials for RC	c	-			 	
		Assume RCC	plant set up at dam site and materials			1		-
		trucked to				 		
		Assume conci	rete sand and aggregates come from			 	-	
			or Yakima river basins and have a			† ··-		
		haul dista	ince of 17-18 miles ave.				<u> </u>	
]		Assume ceme	nt shipped by rail to redi-mix plants					
_ ·	· 	that are 2	0 miles ave. distance from sitc.					
		Dam excavation a	nd backfill	D8130	· ·			
	1		ockpile (1ft. Thick)		135,000	CY	\$2.00	\$270,000.0
	2	Excavate common	material for dam foundation	- 	10,500,000	CY	\$3.50	
_	3	Excavate rock for a	lam foundation		105,000	CY	\$13.00	
		Assume ~ 1%	of common excavation	<u> </u>		<u> </u>		47,50.7,000.0
	4	Excavate rock for (DW on right abutment		5,300	CY	\$32.00	\$169,600.0
. —	5	Backfill with comm	non material from excavation		4,300,000	CY	\$3.50	\$15,050,000.0
		Foundation Treat	ment - Exc. And concrete treatment	D8130				
	6	Extra rock excavati	on for fault treatment		75,000	CY	\$13.00	\$975,000.0
		Assume south	abutment is fractured					\$773,000.0
		Assume excav	ate with hydraulie excavator					
	7	Dental concrete for	fault treatment		2,500	- CY	\$150.00	\$375,000.00
	. 8	Dental concrete for	general foundation treatment		10,000	CY	\$130.00	\$1,300,000.00
	9	Furnish and handle	cement (.282T/CY)		3,500	TONS	\$120.00	\$420,000.00
		Dam 3 Subtotal					 .	\$56,674,600.00
			QUANTITIES			Þ	RICES	
B Y	Doug Stan	ton Del	снески	BY I	Donaldson		CHECKED	tox amos
ATE PREI		 -	PEER REVIEW	DATE PREP	ARED		PEER REVIEW	las shloa
	4/24/04				08/17/04		1	Try Stulan

FEAT				PROJECT:					
I		Dam and Reserv			Yakima River	r Basin W	Vater Storage O	ptions	
I		oir - Active Storage= Roller Compacted C	= 1.3 MAF Concrete (RCC) Dam	REGION	N PN	I PRICE	LEVEL:	Appraisal	
ĺ	•	•	,	EILE.					
Dam3 -	- Civil/St	Structural			C:\Documents and Revisions\ Black	Settings\bv: Rock Dam_	vanotte\Desktop\Blac 1.3MAF Rev 1.xls St	:k Rock\Black Rock	
P K	ſĘW					T		1	
PLANT	PAY ITEM		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT	
			ment - Consolidation grouting	D8130		† <u> </u>	 		
Ī	10	O Setups for drilling gr	grout holes		21,800) EA	\$50.00	\$1,090,000.0	
l	<u></u>	Assume 2-inch	dia, drilled on 10-foot centers			†	T	†	
l	11	Drill grout holes - 2-	-in. dia @ 30 ft long		654,000	LF	\$15.00	\$9,810,000.0	
l	12	2 Hookups to grout ho	oles		21,800		\$35.00		
	13	3 Pressure grout			1,308,000		\$6.50	\$8,502,000.0	
Ī		Assume groutin	ng process only minus cement	···	i	 		φυ ₁ υ ο = 3 ο ο ο ο ο ο ο ο ο ο ο ο ο ο ο ο ο	
Ī		Assume 2 CF pe			ı · 			 	
	14		cement for pressure grouting		1,308,000	BAGS	\$7.00	+	
	_	Assume I bag po			1,000,000	BAUS	57.00	\$9,156,000.0	
 		Foundation Treatr	nent - Grout Curtain thru gallery	D0120			<u> </u>		
l				D8130		 /	‡ <u></u> !	l	
i	122	Setups for drilling gr			675	EA	\$100.00	\$67,500.0	
ı'	·		dia. Holes on 10-foot centers			<u> </u>	4!	1	
i'	101	5 Drill grout holes	·		170,000	LF.	\$15.00	\$2,550,000.0	
 '			dia. w/depth ~55% ave H		<i>'</i>	<u> </u>	<u> </u>	<u> </u>	
<u> </u> '	1	Hookups to grout hol	les		675	EA	\$100.00	\$67,500.0	
	18)	Pressure grout			340,000	CF	\$7.00	\$2,380,000.0	
!			ng process only minus cement					<u> </u>	
·!	1	Assume 2 CF pc					<u> </u>	ı	
	[9]		coment for pressure grouting		340,000	BAGS	\$8.00	\$2,720,000.00	
		Assume I bag po		 			r	<u>ΨΔ,1 = 0,00</u> .	
	20		pipe nipples (assume 4/drain)		2,700	LF	\$60.00	\$162,000.00	
		Leveling Concrete fo	for Foundation	D8130		 			
		···	3-foot thick over footprint	-	267,000	CY	\$200.00	#57 400 000 0	
)		Furnish and handle co		·	75,000		l———————————————————————————————————	\$53,400,000.00	
				++	73,000	TONS	\$100.00	\$7,500,000.00	
]		Drill foundation dra		D8130				·	
]		Setups (assume 10-ft of	centers)		700	EA	\$100.00	\$70,000.00	
	[24]	Drill holes			175,000	LF	\$15.00	\$2,625,000.00	
	- -	Assume 4-inch d'	dia. w/length= 33% dam height.				-		
	r +	Drill formed drains	in dam body along U/S face	D8130		, —			
	i T	Assume 10-ft ctrs		1 2000		+	+		
	25	Lower gallery - Setup			140		2120.00		
	1 —		s drilled from gallery upward		94 500	EA _	\$100.00	\$44,000.00	
	1 F	Upper gallery - Holes		+	94,500	LF	<u>\$15.00</u>	\$1,417,500.00	
+			os drilled from dam crest to gallery		670	EA	\$100.00	\$67,000.00	
		Opper gamery - more	Julled from dam crest to gailery	++	142,500	LF	\$15.00	\$2,137,500.00	
				+ +					
	<u>l</u> *	Dam 3 Subtotal	UANTITIES					\$104,529,000.00	
BY		~ 0	T				ICES		
	Doug Stante	ton 1	CHECKED	BY D.	Donaldson	C	CHECKED GOV	8/17/04	
OATE PREF		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	PEER REVIEW	DATE PREPA	RED	P	CHECKED GOV	I I IM	
	4/24/04		<u></u>	ŀ	08/17/04		',υ	Poplication	

	ATURE:		PROJECT:					
		Dam and Reserv		İ		r Basin W	Vater Storage O	ptions
		-	= 1.3 MAF Concrete (RCC) Dam	REGION	N PN	PRICE	E LEVEL:	Appraisal
	- Civil/Str	tructural					vanotte\Desktop\Blac 1.3MAF Rev_Lxls Si	ck Rock\Black Rock
PLANT	PAY ITEM		DESCRIPTION	CODE	QUANTITY	LINIT	UNIT PRICE	AMOUNT
		Construct RCC Da		20130				
			Dam b/CY cementitious material	D8130	İ	-		ł
	+ +	· 	b/CY cementitious material fly ash and 60% cement		 	-		
	++		gate processed and hauled 15-20 miles					
			gate processed and hauled 15-20 miles nt hauled 20-25 miles	-	<u></u>	<u> </u>		
	29	Construct RCC test			4.100	‡	2140.00	2574.000
	· · · · · · · · · · · · · · · · · · ·		t section tensions = 100' x 35' x 30'		4,100	CY	\$140.00	\$574,000.0
	+			-		 '	·	
	-+		ent. Conc. Facing elements	··				
· 1	1 -		porated into thrust block for stilling control house		t	<u> </u>		
	1		control house ry forming, waterstops, Contraction	· J	t ———	╁	 	
· ,	 · · · · +		ry forming, waterstops, Contraction ng elements, bonding mortar		1		↓	
/		Joint, facing (no grouting		<u> </u>	ſ <u></u>			
		Construct RCC Dar	m (Complete in Place)		22.018.000	+	#2° 00	77.5504.000.1
		Furnish and handle c			22,018,000 3,027,500		\$28.00	\$616,504,000.0
			ssume 1/2-inch thick/lift on all lifts)	+ +	3,027,500 975,000		\$90.00 \$70.00	\$272,475,000.0 \$68,250,000.0
	<u> </u>					ĬŢ.	V ·	\$00,400,000
		Cast-in-place Conve	/entional Concrete	D8130			Ţ	
		1	lipformed on U/S face	<u> </u>	200,000	CY	\$100.00	\$20,000,000.0
		Facing elements - sla			244,000	CY	\$100.00	\$24,400,000.0
		Furnish and handle co			125,200	TONS	\$100.00	\$12,520,000.0
	35	FRP Reinforced conc	acrete dam crest		11,200	CY	5250.00	
	[·—— }	Assume 1.5 foot thiel		+ +	1,800,000		\$250.00 \$0.80	\$2,800,000.00 \$1,440,000.00
		Furnish and handle co		[1,800,000 3,100	TONS	\$0.80 \$120.00	\$1,440,000.00 \$372,000.00
							3120.0	S372,000.00
	- 38 F		O on both w/s and describe		2,600	CY	\$400.00	\$1,040,000.00
	70		0 on both u/s and d/s sides	+		<u> </u>		
		F & P reinforcement (416,000	LBS	\$0.80	\$332,800.00
	401	Furnish and handle ce	ement (.282T/CY)		750	TONS	\$120.00	\$90,000.00
				# #				
				+ +	··· }	,——		
				1 1				
		Dam 3 Subtotal				-+		\$1,020,797,800.00
			DUANTITIES			PR	ICES	\$1,020,777,000.00
ע	Dong Stanto	ton DY	CHECKED	BY D.). Donaldson	C	CHECKED SOV	/ alminh
ATE PREP	PREPARED PEER REVIEW			DATE PREPARED OR/17/04 CHECKED SOV 8/17/04 PEER REVIEW OR/17/04				9/11/04
	4/24/04			08/17/04		Ψ,	My Stark.	

FEATUR			***************************************	PROJECT:					
		Dam and Reservoir - Active Storage=			Yakima River	г Basin W	Vater Storage Op	ptions	
		_	Concrete (RCC) Dam	REGION	I PN	PRICE	E LEVEL:	Appraisal	
Dam3 - Civ	ivil/St	ruetural					vanotte\Desktop\Black 1.3MAF Rev 1.xls]Su		
PLANT	РАУ ПЕМ		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT	
₹	<u> </u>			'				<u> </u>	
		Construct RCC Da	am (continued)	D8130		<u></u>			
	41	Form lower drain/g	rout gallery/adits within RCC section		7,000)	\$50.00	\$350,000.0	
			ride x 10-ft high across base of dam		F -		<u> </u>		
			ns Panel system for 12" RCC lifts			+	<u> </u>	<u></u>	
]								
l	42	· · · · · · · · · · · · · · · · · · ·	ge gallery/adits within RCC section		4,800	LF	\$50.00	\$240,000.0	
<u> </u>			ide x 10-ft high across base of dam		<u> </u>	<u> </u>			
<u> </u>		Assume Symon	ns Panel system for 12" RCC lifts		Ī	<u>'</u>			
	43		terstops for u/s CrJs & facing elements		119,000	LF	\$15.00	\$1,785,000.0	
<u> </u>			rJs @ 50-ft centers					í	
	441	T	s @ CrJ's in facing elements		59,500	<u>LF</u>	\$15.00	\$892,500.0	
<u> </u>			of waterstops and 6 ft wide)		<u> </u>			t	
		Similar to Millto	own Hill			1			
; · -	45	IR&I Metal crack inc	Jucer plates for CrJs in RCC		5,587,000	LF		F	
ı <u> </u>	-	Assume placed e		+	3,301,000	Lr	\$8.00	\$44,69 <u>6,000</u> .0	
		Similar to Puebl		+ +		 		· · · · · · · · · · · · · · · · · · ·	
				-	!			i ——	
		Abutment Adits		D8130			<i>i</i> — j	 . .	
 			t Dia, for adit (15,500 CY)		1,100	Li	\$2,500.00	\$2,750,000.0	
	47 F	Remove and stockpil	ile rock (assume local stockpile)		15,500	CY	\$20.00	\$310,000.0	
_	48 F		2500-10-ft long x 1-inch dia.		12,500	L.F	\$60.00	\$750,000.0	
]		A307, 20K rockl	sbolts				ı		
			teel sets (W8 x 48) in crown		200,000	LBS	\$4.00	\$800,000.0	
		FF & P concrete in ac			7,300	CY	\$350.00	\$2,555,000.0	
 	_51 F	Furnish and handle co	ement (.282T/CY)	<u> </u>	2,100	TONS	\$120.00	\$252,000.0	
	-	. 124.	· · ·			·			
	·	Grout adits Setups for drilling are		D8130		<u> </u>			
	341	Setups for drilling gro and 8 holes per ri	rout holes (2-in dia holes, 10 ft ctrs,	+	880	Ел	\$100.00	\$88,000.0	
	53 [Drill grout holes (2-in		+ $+$	25.400				
		Hookups to grout hole		-	26,400	LF _	\$20.00	\$528,000.00	
			ting process only minus cement)		52 800	EA	\$100.00	S88,000.0	
<u> </u>		Assume 2 CF per		++	52,800	·CF	\$8.00	\$422,400.0	
	56 F		ement for pressure grouting	-1	52 800				
	Ì	Assume I bag pe		++	52,800	BAGS	\$10.00	\$528,000.00	
	\Box			+ +					
	_ _			+ -	·			<u> </u>	
	Dam 3 Subtotal							\$57,034,900.00	
-		<u> </u>	UANTITIES	<u> </u>			ICES		
· · · · · ·	ig Stanto	on DI.	CHECKED	BY D.	Donaldson OCO	CI	CHECKED BOV 3/	117/4	
PATE PREPAR 4/24	· · · · · · · · · · · · · · · · · · ·			DATE PREPA	08/17/04	PJ	CHECKED SOV 3/ PEER REVIEW O	d status	

FEATURE: Black Rock Dam and Reservoir				PROJE	PROJECT: Yakima River Basin Water Storage Options					
		oir - Active Storage=		<u></u>						
Dam i	ype 3: 7	Höller Compacted C	Concrete (RCC) Dam	REGION FILE:	N PN	PRICE	LEVEL:	Appraisal		
		llaneous		FILE:	C:\Documents and Revisions\ Black	I Settings\bv: Rock Dam_I	vanotte\Desktop\Blac 1.3MAF Rev 1.xls S	ck Rock\Black Rock Summary		
PLANT ACCOUNT	PAY (TEM		DESCRIPTION	CODE	QUANTITY	UNIT	IJNIT PRICE	AMOUNT		
	- -					-				
		MISCELLANEOU	JS							
· -		Instrumentation				+	<u>-</u>	-		
<u></u>		Assume part of	l'unlisted items		<u></u>	<u> </u>				
			<u> </u>			+		ļ		
						<u> </u>				
<u> </u>			·							
			······································		·			 - · · .		
										
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	[
	+	Dam 3 Subtotal		-· -			<u>_</u>			
	QUANTITIES					PR	ICES	\$0.00		
Y	Dick LaFor		CHECKED M.R.O.Sh.	BY D.	Donaldson	Lou		almal		
ATE PREPARED PEER REVIEW			DATE PREPARED OS/17/04 CHECKED BOV 4/17/04 PEER REVIEW OS/17/04			3/1/04				
4/24/04 08/17/04 PEER REVIEW JAS 8/10			mg 8/10/04							

FEAT	URE:			PROJECT:					
		Dam and Resen oir - Active Storage=			Yakima Riv	er Basin	Water Storage (Options	
		Vorks for Rockfill Da		REGION	N PN	PRICE	E LEVEL:	Appraisal	
	- Civil/s	Structural		FILE:	C:\Documents a Revisions\[Blac	and Settings\	s\bvanotte\Desktop\Bla m_1.3MAF Rev 1.xls}	lack Rock\Black Rock	
NI TUXT	E H								
PLANT ACCOUNT	PAY ITEM		DESCRIPTION	CODE	QUANTITY	TINU	UNIT PRICE	AMOUNT	
		Establish Upstream	m Portal	D8130					
F	I	l Common excavation	n to establish tunnel portal	†	67,000	CY	\$10.00	\$670,000.	
	2		establish tunnel portal	†	8,300		\$30.00		
	1		chain link fabric around portal	†	350	I	\$20.00	 	
			n. dia resin anchors for fabric support	<u> </u>	40	_	\$75.00	1	
	<u> </u>	Establish Downstre		D8130					
Ĺ'		· 	n to establish tunnel portal	<u></u>	67,000	CY	\$10.00	\$670,000.0	
Ĺ '			establish tunncl portal		8,300		\$30.00	- ·	
Ĺ '	7	Furnish and install ch	chain link fabric around portal	ļ'	350	 	\$20.00		
<u> </u>			n. dia resin anchors for fabric	<u> </u>	40		\$75.00		
	T		unnel u/s of gate chamber	D8130			· /		
L!			t Dia.circular shaped u/s tunnel (18,400 CY)		700	LF	\$4,000.00	\$2,800,000.0	
i			ile rock (assume local stockpile)		18,400	CY	\$20.00	\$368,000.0	
	111		790-10-ft long x 1-inch dia.	Γ1		<u></u>		[
l!	4 2	A307, 20K rockl			7,900	LF	\$60.00	\$474,000.0	
I!	121	Furnish and install 9	steel sets (W8 x 48) in crown	Γ	45,000	LBS	\$4.00	\$180,000.0	
	 	Construct ROW tu	mnel d/s of gate chamber	D8130		l	 		
	1 r		t OD mod.HS shaped d/s tunnel (23,000 CY)		600	LF	\$5,500.00	\$3,300,000.0	
			le rock (assume local stockpile)	<u> </u>	23,000	CY	\$5,500.00	\$3,300,000.0 \$460,000.0	
			40-10-ft long x 1-inch dia.	tJ	ı -)	1	L		
		A307, 20K rockt		T +	7,400	LF	\$60.00	\$444,000.0	
	16	1	steel sets (W10 x 54) in crown	Ī	47,000	LBS	\$4.00	\$188,000.0	
	<u> </u>	Construct ROW Ga	ate Chamber and Shaft	D8130		- +	·		
		T	diameter shaft (800 CY)	[]	40	LF	\$7,000.00	\$280,000.0	
	1 1		le rock (assume local stockpile)	ī T	800	CY	\$7,000.00		
			4 - 10-ft long x 1-inch dia.	(-	+	<u> </u>	Φενιου	\$1 <u>6,000.</u> 0	
	ļ [A307, 20K rockb	bolts		640	l.F	\$75.00	\$48,000.00	
			circular steel sets (W8 x 48)		17,000	LBS	\$4.00	\$48,000.00 \$68,000.00	
-	,	Place Conc. Lining I	In Tunnel, Shaft & Gate Chamber	D8130	—— <u>}</u>				
	21	FF&P reinf. Concrete	e in u/s steel-lined tunnel		10,200	CY	\$350.00		
		FF&P reinf, concrete			600	CY	\$500.00	\$3,570,000.00 \$300,000.00	
		FF&P reinf. Concrete		. —]	11,400	CY	\$350.00	\$300,000.00 \$3,990,000.00	
	24 F	Furnish and place rein	nforcement (160 lbs/CY)		3,550,000	LBS	\$0.90	\$3,990,000.00 \$3,195,000.00	
		Furnish and handle cer				TONS	\$120.00	\$3,195,000.00 \$756,000.00	
		ROW1 Subtotal		- +				·	
			UANTITIES			PF	RICES	\$22,295,000.00	
B Y D	Doug Stante	FIL	снескер В	BY D.	J. Donaldson				
	TE PREPARED PEER REVIEW		Diving Designation	DATE PREPARED PEER REVIEW O				111/04	
/	4/24/04				6,300 TONS \$120.00 \$7 \$22,2 PRICES D. Donaldson CHECKED ADJ 9,17/04				

FEAT				PROJECT:						
		Dam and Reser			Yakima Riv	/er Basin V	Water Storage Op	otions		
_		oir - Active Storage		====		7				
River ∪	utlet vv	Vorks for Rockfill Da	ams	REGION	N PN	PRICE	LEVEL: A	Appraisal		
	- Cívil/s	Structural		FILE:			bvanotte\Desktop\Black i_1.3MAF Rev 1.xls Sur			
PLANT ACCOUNT	ITEM									
PLA	PAYTEM		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
<u> </u>	<u> </u>	Ring Grout Upstro		D8130						
	.26		grout holes (2-in dia holes, 20 ft ctrs,		36	EA	\$150.00	\$5,400.		
		and 8 holes per			<u> </u>	\perp	 . _			
<u></u>			2-in dia and L=30 ft)		8,640	1	\$20.00	\$172,800.		
	1	Hookups to grout h			288	 	\$100.00	\$28,800.		
	29	1	outing process only minus cement)		17,300	CF	\$10.00	\$173,000.		
	<u> </u>	·	per 1 LF of hole			<u> </u>	ı <u>.</u>			
ļ	30	·	e cement for pressure grouting		17,300	BAGS	\$12.00	\$207,600.		
· —	<u>-</u>	Assume I bag	, <u>per CF</u>	<u>'</u>			<u>. </u>			
	<u> </u>			'	<u></u>	\perp				
!	F 1		and Gate Chamber	D8130		↓	i			
<u></u>	312		grout holes (2-in dia holes, 20 ft ctrs,		5	EA	\$200.00	\$1,000.0		
·	ļ'	and 8 holes per		'			<u> </u>			
		Drill grout holes (2-		!	1,200	LF -	\$25.00	\$30,000.0		
	I	Hookups to grout he			40	EA	\$150.00	\$6,000.0		
!	341	T'	outing process only minus cement)		2,400	CF	\$15.00	\$36,000.0		
	<u> </u>		per 1 LF of hole		['	1				
!	351		coment for pressure grouting		2,400	BAGS	\$15.00	\$36,000.0		
;· -l		Assume I bag p	per CF		<u> </u>			·· ·		
 		Ring Grout Downs		D8130	<u> </u>					
	[36]	· · · · · · · · · · · · · · · · · · ·	grout holes (2-in dia holes, 20 ft ctrs,		6	EA	\$200.00	\$1,200.0		
	Ī	and 8 holes per	r ring)		<u> </u>					
}	I	Drill grout holes (2-	·· · · · · · · · · · · · · · · · · · ·		1,440	LF	\$25.00	\$36,000.0		
	1	Hookups to grout he			48	EA	\$150.00	\$7,200.0		
	39		uting process only minus cement)		2,880	CF	\$15.00	\$43,200.0		
	ļ .	Assume 2 CF pe	per I LF of hole		ı —					
	40	Furnish and handle of	cement for pressure grouting		2,880	BAGS	\$15.00	\$43,200.0		
	ı—	Assume I bag p								
	<u> </u>	Earthwork - intak	e, u/s conduit, d/s pipe,					·		
			and discharge channel	+	- $+$	_ +				
		Excavation of comm	non materials for basin and channel	_	400,000	CY	\$4.00	\$1,600,000.0		
	42 F	F & P impervious ma	naterial (Zonc 6 Ringold - local)	1 7	20,000	CY	\$4.50	\$1,600,000.0		
			iprap (zone 3 gravel)	+	10,000	CY	\$30.00	\$90,000.0 \$300,000.0		
			dam excavation (riprap)		30,000	CY -	\$10.00			
			ntake and u/s conduit (Ringold - local)	+ +	16,000	CY	\$10.00	\$300,000.0		
			non materials for burying 16' pipe	7 -1	312,000	CY	\$7.00	\$112,000.0		
			16' dia. Pipe - zonc 3 bedding	+++	20,000	CY		\$1,560,000.00		
			16' dia. Pipe - From common exc.	-11-	197,000	CY	\$40.00	\$800,000.0		
		ROWI Subtotal	19 THE STREET	++	- 131,000	- t-	\$7.00	\$1,379,000.00 \$6,968,400.00		
			UANTITIES	+		PR	ICES	\$6,968,400.00		
ву		(1)	CHECKED 12	BY D.	D. Donaldson					
	Doug Stante	ion XIX	(3,20)		D. Donaldson		BOV &	:/17/04		
OATE PREP	PARED 4/24/04		PEER REVIEW	DATE PREPA		PE	HECKED BOV G BER REVIEW JAS	, lad		
	W24NI+				08/17/04		1CA->	Spirito,		

1	ATURE:			PROJECT:					
		Dam and Res			Yakima Riv	/er Basin '	Water Storage O _I	ptions	
_		oir - Active Storag Vorks for Rockfill		REGION	N PN	PRICE	LEVEL:	Appraisal	
				FILE:	C:\Documents a	and Settings\b	\bvanotte\Desktop\Black	ck Rock\Black Rock	
	<u> </u>	Structural			Revisions\[Black	k Rock Dam	n_1.3MAF Rev 1.xlsJSt	ummary	
PLANT ACCOUNT	PAY ITEM		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT	
	 	Construct ROV	W cast in place (CIP) concrete	D8130					
l	45	9 Furnish, form, a	and place reinf. Cone - Intake structure		12,000	CY	\$350.00	\$4,200,000.	
i			cc reinforcement (est 180#/CY)		2,160,000	1 1	\$0.80	\$1,728,000.	
.			idle cement (.282T/CY)		3,400		\$120.00	\$408,000.	
_	5.	a BEP Reinf. Conc	c - Steel lined U/S Conduit (L=400')		11,000	CY	\$350.00	ድን የናለ ለበበ	
···			ce reinforcement (est 170#/CY)		1,870,000	1	\$350.00 \$0.80	\$3,850,000. \$1,496,000	
, 		1	idle cement (.282T/CY)	<u> </u>	3,100	 I	\$120.00	\$1,496,000. \$372,000.	
ı'			rete - CIP shaft (L=375)		6,400		\$350.00	\$2,240,000.	
!	1		ce reinforcement (est 170#/CY)		1,088,000	1 1	\$0.80	\$870,400.	
i!	51	Furnish and hand	dle cement (.282T/CY)		1,800	TONS	\$130.00	\$234,000.	
,	·		cte - shaft control house		440	CY	\$500.00	\$220,000.0	
·!	59	9 Furnish and place	ce reinforcement (160#/CY)		70,000		\$1.00	\$70,000.0	
		· · · · · · · · · · · · · · · · · · ·	dle cement (.282T/CY)		120	TONS	\$160.00	\$19,200.0	
₁	61	DED seinf. Concr	rete in gate chamber		450		2500.00	***************************************	
,-··)			rete in gale chamber te reinforcement (160#/CY)		72 000	LRS	\$500.00	\$225,000.0	
,			dle cement (.282T/CY)	-	72,000	TONS	\$1.00 \$160.00	\$72,000.0 \$20,800.0	
!			· · · · · · · · · · · · · · · · · · ·		i	1000	<u> </u>	\$20,800.0	
]	1		cte - D/S access house		500	CY	\$500.00	\$250,000.0	
			e reinforcement (160#/CY)		80,000	LBS	\$1.00	\$80,000.0	
	66)	Furnish and hand	dle cement (.282T/CY)		140	TONS	\$160.00	\$22,400.0	
	67	FFP reinf. concre	cte for thrust block @ 80 deg bend		5,100	CY	\$400.00	\$2,040,000.0	
			e reinforcement (130 #/cy)	<u> </u>	663,000	LBS	\$0.80	\$2,040,000.0 \$530,400.0	
	1		ile cement (.20T/CY)		1,020	TONS	\$130.00	\$132,600.0	
-	ر 70	EED roinf concre	ete - jet flow gate control house		700	<u> </u>		··	
·· j			ete - jet flow gate control house c reinforcement (160#/CY)		700 112,000	CY	\$800.00	\$560,000.0	
			lle cement (.282T/CY)	+ +	200	TONS	\$1.00	\$112,000.0 \$32,000.0	
						<u> </u>	Ψ. σ	402,000	
			ete for thrust block @ jet gate house		4,100	CY	\$400.00	\$1,640,000.0	
			e reinforcement (130 #/ey)	[533,000	LBS	\$0.80	\$426,400.0	
<u> </u>		Furnish and names	le cement (.20T/CY)		820	TONS	\$140.00	\$114,800.0	
				_		-+	<u> </u>		
		ROW1 Subtotal						\$21,966,000.0	
BY			CHECKED				RICES		
	Doug Stant	nton \	CHECKED CHECKED	BY D.	Donaldson	CI	CHECKED	~- 4 /	
ATE PREP		100	PEER REVIEW	DATE PREPA	·	——————————————————————————————————————	De la Company	117/04	
/	4/24/04		Dis , Z	08/17/04	[_	BOV 8 EER REVIEW Joh	Balalou		

FEAT				PROJECT:						
		Dam and Rese			Yakima Riv	er Basin	Water Storage O	ptions		
_		oir - Active Storage				·,				
River C	Outlet W	orks for Rockfill Da	ams	REGION	PN	PRICE	LEVEL:	Appraisat		
ROW1	- Mech	anical					\bvanotte\Desktop\Bla n_1.3MAF Rev 1.xls S			
55	Į Į									
PLANT ACCOUNT	PAY ITEM		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
	 -						<u> </u>			
	-									
	ļ <u>.</u>						<u> </u>			
	176	Miscellaneous Met		D8120	14,000	LBS	\$7.00	\$98,000		
	 		in shaft to gate chamber, elevator				<u> </u>			
<u> </u>	-	1	nisc metal in gate house, gate			<u></u>				
		chamber and E	VS gate house.			<u> </u>	<u> </u>			
						ļ <u>-</u> -	-			
		Mechanical					 			
	 									
		Furnish and install		D8410	337,500	LBS	\$4.00	\$1,350,000.		
			one bulkhead 22' x 24' @ 400' head	D8410	144,000	LBS	\$4.00	\$576,000.		
	1 79	Furnish and install :	seats and guides with lid	D8410	23,900	LBS	\$6.00	\$143,400.		
		Ei-td-i11			<u> </u>					
	OV	!	one elevator, capacity = 500 lbs	D8410	1	_UNIT_	\$150,000.00	\$150,000.		
			100 fpm, travel = 450',							
		landings = 2, type =	reignt	—						
		IIVAC for:					ļ			
	 		6 ft die monsteel turnel and	D-8410			<u> </u>	·		
	ļ		6-ft dia. penstock tunnel and Pdia shaft to gate chamber)				ļ			
		450-11 deep by 24	oda snatt to gate chamber)				<u> </u> -			
	R1	Centrifugal fan rate		D 0410			0.7.000.00			
			tic pressure, 1200 fan rpm max,	D-8410		EA	\$15 <u>,000.00</u>	\$30,000.0		
			outlet velocity, with adjustable sheave	-			-			
			for 50% speed (8000-cfm at 2"sp)			-		·		
	·		160-V, 3-Ph, 60-Hz, 1800-rpm motor.	}			ł ————			
		(approx 700-lbs+me								
		(approx 700)03111R	Will Will	-	-					
	82	48" Dia, 16-ga galy	st. duct 4700 ft long	D-8410	100 000	I DC				
			pprox = 40 - lbs/linear(t)	D-0410	188,000	LBS	\$7.50	\$1,410,000.0		
		<u></u>				[
		For 50-degree F tem	perature rise for winter ventilation,	<u> </u>						
			culated air & 10% outside air					- ·		
		30-kVa Electric Duc		D-8410		EA	\$15,000.00			
		480-V, 3-ph, 60-hz		100		EA		\$30,000.0		
			air requires total of 515-kW heat	\dashv $-+$	·	-				
			onstruction level ventilation	 			——			
			ction level ventilation)	··· -	———— —	— <u>†</u>				
		<u></u>		 			·			
T	i			 			—·· -—			
	_	ROW1 Subtotal		+ - +				£2 787 400 pc		
QUANTITIES					PF	RICES	\$3,787,400.00			
Y I				₹» By	Depaldson	·	_	· ·····		
Schlein, A, Ritt, R. Christensen (D8410)		1	De Co	ľ	THECKED Bov 8/	17/04				
	TE PREPARED PEER REVIEW		DATE DEEDA DED							
	4/24/04		DATE PREPARED OS/17/04 DATE PREPARED OS/17/04 CHECKED BOV 8/17/04 PEER REVIEW OS/17/04			l alolou				
	47247()4				V6/17/04		1 /CM 8/NOA			

JFEAT Black		Dam and Reservoir	PROJECT: Yakima River Rasin Water Sturage Ontions						
		pir - Active Storage= 1.3 MAF		t akiiia Kiy	et Dasiii	water Storage Op	ottons		
_		/orks for Rockfill Dams	REGION	l PN	PRICE	LEVEL:	Appraisal		
ROW1	- Mech	anical	FILE:						
7. TA:	EM								
PLANT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	PRICE Apprairable Apprai	AMOUNT			
	<u> </u>	Mechanical (cont.)		<u></u>					
	<u> </u>	Heating and Ventilating	D-8410		<u> </u>				
		50'x40'x24' Control House		,	<u></u>				
	84	Centrifugal fan: I each	D-8410	ì	EA	\$2,500.00	\$2,500		
		Single speed,1500 cfm at 0.50 inches w.g. static							
	<u> </u>	pressure, forward curve, direct drive; 3/4 hp motor							
		rated 480 Vac, Three phase, 60 Hz.				-			
	85	Propeller fan assembly: 1 each	D-8410	1	EA	\$3,000.00	\$3,000.		
		Single speed, 4,800 cfm at 0.50 inches w.g. static			<u> </u>				
		pressure, belt drive; 1.5 hp motor rated 460 Vac,			ļ <u> </u>				
		three phase, 60 Hz; include fan wall mount							
		housing with motor guard.							
	86	Unit heaters:	D-8410	4	EA .	\$750.00	\$3,000.		
	<u></u>	Electric horizontal discharge rated 7.5 kw,					·······		
		460 Vac, 3-phase, 60 Hz. (One each corner -18' throw)							
		with wall thermostats							
							<u> </u>		
	87	Control dampers: All motor operated, parallel blade,	D-8410						
		low leakage type with edge and side seals:							
		48" wide x 48" high - 1 each	<u> </u>		EA	\$2 500.00	\$2,500.0		
		36" wide x 36" high - Leach		1	——i	· ·	\$1,500.0		
		Stationary louvers: All 16 gauge galvanized steel,	D-8410			_·			
		4-inch deep frame, 45 degree blades on 4-inch centers,		}					
	· -	45 percent free area, with insect and bird screen: 48" wide x 48" high - 1 each							
	-	36" wide x 36" high - 1 each	\rightarrow				\$2,000.0		
		wide A to Might - Peach	<u> </u>			\$1,000.00	\$1,000.0		
	+					<u> </u>			
		ROW1 Subtotal							
	QUANTITIES				PR	ICES	\$15,500.00		
Υ		CHECKED	BY D.	. Donaldson		HECKED			
	aul Schlei	N-12		Dea		BOV 81	17/04		
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	EATURE: ack Rock Dam and Reservoir			PROJECT:						
				Yakima River Basin Water Storage Options						
_		ir - Active Storage orks for Rockfill Da		DEGIGN	DN.	Innice	LEE			
nivei U	udet vo	OIKS IOI MOCKIIII Da	arns	REGION FILE:	PN	PRICE	LEVEL:	Appraisal		
ROW1	- Mecha	anical		11767:	C:\Documents ; Revisions\[Blac		ick Rock\Black Rock Summary			
PLANT	PAY ITEM		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
						†				
						···	-]		
	<u> </u>	Mechanical								
-		(Continuation of I	· · · · · · · · · · · · · · · · · · ·	D-8410	···	↓				
		(50'x40'x24' Contr	of House)			<u> </u>				
	·- ··					-	 			
	89	Fan motor starters:	Design, furnish and install	D-8410	2	EA	\$2,500.00	\$5,000.		
		control system						45,000		
	90		gauge galvanized steel with	D-8410	250	LBS	\$10.00	\$2,500		
			A90 G120) galvanized			<u> </u>	<u> </u>	<u> </u>		
		coating: Air plenum: 250						- ·		
		Ali pienum. 2.30			_	 	·			
	91	48"x48" galv steel i	ntake air filter frames using	D-8410		EA	\$2,000.00	\$2,000.		
			disposable filter elements in frame		- <u>·</u>			Ψ2,000.		
,		with dirty filter diff	erential pressure sensor with					·		
	-	warning light and i	remote signal.	_						
	92		ble fiberglass, 30% min efficiency, timate 9 elements with	D-8410	36	EA_	\$25.00	\$900.0		
···· i			tartup and two replacements each.							
			and two reprocesses each.	-			· ·			
	93	Galv. Steel duct and	fan supports.	D-8410	200	LBS	\$10.00	\$2,000.0		
	-									
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	F	ROW1 Subtotal								
QUANTITIES					PF	UCES	\$12,400.00			
у СНЕСКЕД			BY D.	Donaldson		THATE				
	aul Schlei	n	Aur		Ded	Ĭ	BOV	6/17/04		
ATE PREI		- ,	PEER REVIEW	DATE PREPA	RED	P	EER REVIEW	. 1		
	4/24/04				PRICES BY D. Donaldson CHECKED BOV 8/17, DATE PREPARED PEER REVIEW 263					

1	EATURE:			PROJECT:						
		Dam and Rese		Yakima River Basin Water Storage Options						
1 -		oir - Active Storago Torks for Rockfill E		REGION	l PN	PRICE	LEVEL:	Appraisal		
				FILE:		•	bvanotte\Desktop\Black			
ROW1 -	T	anical	<u> </u>		Revisions\ Blac	k Rock Dan	a_1.3MAF Rev 1.xls}St	mmary		
PLANT ACCOUNT	PAY ITEM	į	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
	ļ	Steel penstock	· ···		<u> </u>					
		FURNISH-AND-	INSTALL THE FOLLOWING:	D8420						
	94	240-inch steel pip	e, encased in concrete		4,260,000	LBS	\$2.00	<u>\$8,520,000</u>		
	· · · · · ·		-1/2-inch wall, 4290 lb per lin. ft.)		::=,			40,520,000		
	95	· :	e, encased in concrete		2,840,000	LBS	\$2.00	\$5,680,000		
		(1000 linear feet, 1	-1/4-inch wall, 2841 lb per lin. ft.)			-				
	96	192-inch steel pip	e buried		660,000	1 DC		<u> </u>		
	~	f—————	1/16-inch wall, 2412 lb per lin. ft.)		660,000	. LBS	\$2.00	\$1,320,000		
·		<u></u>								
	97	192-inch steel pip	e, buried		1,360,000	LBS	\$2.00	\$2,720,000.		
· · · · · -		(601 linear feet, 1-	inch wall, 2269 lb per lin. ft.)					·		
		102 in horastala								
	98	192-inch steel pip	/16-inch wall, 2127 lb per lin. ft.)		1,280,000	LBS	\$2.00	\$2,560,000.		
	!	(doi inicar teet, 15	rto-men wan, 2127 in per mi. it.)							
	99	192-inch steel pipe	e, buried		1,190,000	LBS	\$2.00	\$2,380,000.0		
		(601 linear feet, 7/8	3-inch wall, 1985 lb per lin. ft.)		· ····································					
										
	100	192-inch steel pipe		_	1,110,000	LBS	\$2.00	\$2,220,000.0		
		(600 inicar teet, 13	(16-inch wall, 1842 lb per lin. ft.)					·		
	101	120-inch steel pipe	e, buried and exposed		115,000	LBS	\$2.00			
			16-inch wall, 1154 lb per lin. ft.)			LBS		\$230,000.0		
·	102		vertical, grouted, air vent		115,000	LBS	\$2.50	\$287,500.0		
		(418 linear leet, 3/8	-inch wall, 266 lb per lin. ft.)		-·					
	——I									
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]	ROW1 Subtotal		+ +				\$25 017 500 O		
	QUANTITIES				<u> </u>	PR	ICES	\$25,917,500.00		
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	Cen Smith	<u>.</u>			Dev-			17/04		
	TE PREPARED PERR REVIEW		DATE PREPARED PEER REVIEW			1 - low				
	4/26/04			DATE PREPARED 08/17/04 DATE PREPARED 08/17/04 DATE PREPARED 08/17/04						

	FEATURE:			PROJECT:					
		Dam and Reservoir		Yakima Riv	/er Basin	Water Storage (Options		
_		oir - Active Storage= 1.3 MAF Vorks for Rockfill Dams	REGION	N PN	IouICE	LEVEL:	* - proios]		
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ROW1 -	- Mech	anical	P styr			\bvanotte\Desktop\Bla m_1.3MAF Rev 1.xls}	lack Rock\Black Rock Summary		
TN DI	T A			-					
PLANT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUN'I'		
		Gates and Gate Controls							
i		Furnish and Install	<u></u> ,		† <u> </u>				
	103	F & I -18' x 14' Roller gate w/controls	D8420	180,400	LBS	\$8.00	\$1,443,200.0		
Ē		I - gate and I control box (in shaft house)							
		F&I structural steel for hoist support		10,000		\$4.00	\$40,000.0		
l	105	F & I - 2 - 108-inch jet flow gates w/controls		89,400		\$8.00			
<u> </u>		2 gates and 1 control box		ļ		, , ,			
Ĺ	106	F & I - 36-inch jet flow gate w/controls and bypass pipe		30,000	LBS	\$8.00	\$240,000.0		
·'		I gate and I control box (in shaft house)	<u> </u>		<u> </u>	ļ,	f ·		
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		ROW1 Subtotal	+		• +				
		QUANTITIES	+		PF	RICES	\$2,438,400.00		
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	G. Rood		b1	D. Donaldson	1.	CHECKED NO./	Almal		
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	4/26/04		DATE PREAZ.		l.	RER REVIEW	& alalow		
			L	08/17/04		V	ר אוש הייוש <i>ה</i>		

FEAT	FEATURE:			PROJECT:					
		Dam and Reservoir		Yakima Riv	/er Basin	Water Storage C	Options		
_		oir - Active Storage= 1.3 MAF Vorks for Rockfill Dams	REGION	N PN	I _{PRICE}	E LEVEL:	Appraisal		
111-2	ara.	UNO IOI FIODINII DELID	FILE:						
ROW1 -	<u> </u>	rical				s\bvanotte\Desktop\Bla m_1.3MAF Rev 1.xls ; 			
PLANT	PAY ITEM	nanana manaka	CODE	· · · · Scenary		TOTAL STREET	7.7.7.7.16.74		
PL./ ACC	PAY	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
		Electrical							
		This estimate is for 2 ROW control bldgs, one	[·	-	1		 		
	-	on top of dam and the other downstream for the	-	 	+				
ļ		regulating gates.		1	 		 		
	.,	Assume bringing power to dam part of unlisted items.				<u> </u>			
	-	Furnish and install the following electrical equipment:		ļ					
ļ <u>.</u>		Turnsk and model the tests and	+ 1	 		 			
!	<u> </u>	Grounding System	D-8430	İ	 	†· ·			
	107	· · · · · · · · · · · · · · · · · · ·	<u></u>	6	6 EA	\$180.00	\$1,080.6		
	108			250	1	\$2.50	\$625.0		
j!	!	O	5 9430	<u></u> '	<u> </u>				
_ · ·-		Conduit System Rigid steel conduit	D-8430	(·	 '		·		
r : !	109		→ · · →	200		412.00	±2.400		
·	110		$ \cdot $ \longrightarrow	200		\$12.00	\$2,400.0		
·)	f	PVC conduit, Schedule 40		100	LF_	\$14.00	\$1,400.0		
<u>- </u>				r · ·· ··········	 				
j j	1 -	HDPE (High-density polyethylene)	ļ-——)	600	LF.	\$10.00	\$6,000.0		
	112			1,000	LF	\$15.00	\$15,000.0		
	1]		+		<u> </u>	T			
		Conductors & Cable	D-8430	,					
	<u> </u>	All cable single conductor, stranded copper							
	113	12 AWG		1,500	LF	\$0.90	\$1,350.0		
	114	· · · · · · · · · · · · · · · · · · ·		500		\$1.20	\$600.0		
	115			2,000	 -	\$2.20	\$4,400.0		
	116	I/0 AWG		400		\$2.90	\$1,160.0		
	r H	Electrical Service Equipment	P 9430		· }				
]	117		D-8430						
	118		+ +		EA FA	\$5,000.00	\$5,000.0		
	119		+		EA	\$1,500.00	\$1,500.0		
		3-wire, 600V, 100 ampere			EA	\$1,000.00	\$1,000.0		
			+			 +			
		Panelboards & Electrical Distribution Equipment	†						
	120	Panelhoard, 3-phase, 480V, 250 ampere	1		EA	\$30,000.00	\$30,000.00		
	121	Distribution load center, 15 kVA, 1-phase	1	2	EA	\$10,000,000	\$22,000.00		
		480-240/120V							
-	<u> </u>		+ +	-·		·			
	F	ROW1 Subtotal	+ —		-+		\$93,515.00		
		QUANTITIES	<u> </u>		PF	RICES	Ф7-2g-2 2 0 го с		
Y M	Mike Schuh	CHECKED L Rom'	BY D.	Donaldson		CHECKED	· · · · · · · · · · · · · · · · · · ·		
ATE PREP		PEER REVIEW	- CONTRACTOR	Ned .	-	0/A	2 8/17/04 23 8/19/04		
	4/24/04		DATE PREPA	O8/17/04	Pr	PEER REVIEW	rs alalou		

FEATURE: Black Rock Dam and Reservoir Large Reservoir - Active Storage= 1.3 MAF River Outlet Works for RCC Dam			PROJE	PROJECT:					
				Yakima River Basin Water Storage Options					
			REGION	PN PRI		LEVEL:	Appraisal		
ROW2 -	ROW2 - Civil/Structural					\bvanotte\Desktop\Bla n_1.3MAF Rev 1.xls	ack Rock\Black Rock Summary		
T NT	EM								
PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
		General assumptions			 				
,		Assume ROW located on Rt abutment							
		Cut into rock after dam excavation							
	l-—.—	Assume pipe buried d/s of dam				 			
		[· · · · · · · · · · · · · · · · · · ·			 	· .			
		Assume pipe encased in concrete in dam Assume RCC test section will be the thrust block				···	 -		
		Australia is a contract of the title titlest block			·				
		Foundation preparation	D8130				··		
	<u> </u>	Excavation of rock for OW pipe (hydraulic excavator)		6,000	CY	\$32.00	\$192,000.		
	2	Excavation of common materials for pipe and house		200,000	CY	\$5.00	\$1,000,000.		
		Backfill for burying 14' dia. Pipe - zone 3 bedding		5,000	CY	\$40.00	\$200,000		
	4	Backfill pipe with common materials from excavation		200,000	CY	\$7.00	\$1,400,000.0		
		Furnish and install - 40 -10-ft long x 1-inch dia., A307		400	LF	\$100.00	\$40,000.		
		20K rockbolts - assume 1 every 10 feet							
				_··		ļ · · -——			
 		Install pipe on abutment	D8130						
	6	Furnish, form, and place reinforced concrete		6,000	CY	\$350.00	\$2,100,000.0		
	7	Furnish and place reinforcement (165 lbs/CY)		1,000,000	LBS	\$0.80	\$800,000.0		
	8	Furnish and handle cement (.282T/CY)		1,700	TONS	\$130.00	\$221,000.0		
						·	·		
		Construct Fixed Wheel Gate Control House	D8130						
		FFP reinf, concrete - fixed wheel gate control house		700	CY	\$800.00	\$560,000.0		
		Furnish and place reinforcement (160#/CY)		112,000	LBS	\$1.00	\$112,000.0		
	!	Furnish and handle cement (.282T/CY)		200	TONS	\$160.00	\$32,000.0		
	—-	Construct Jet Flow Gate Control House	D8130						
		FFP reinf, concrete - jet flow gate control house		700	CY		#540,000 O		
· —		Furnish and place reinforcement (160#/CY)		112,000	LBS	\$800.00	\$560,000.0		
		Furnish and handle cement (.282T/CY)		200	TONS	\$1.00 \$160.00	\$112,000.0 \$32,000.0		
		Construct william have a second	·						
—·		Construct stilling basin for jet flow gate discharge	D8130						
		Excavation of common materials for basin and channel	_	400,000	<u>CY</u>	\$4.00	\$1,600,000.00		
		F & P impervious material (Zone 6 Ringold - local)	<u> </u>	20,000	<u>CY</u>	\$4.50	\$90,000.00		
		F & P bedding for riprap (zone 3 gravel)		10,000	CY	\$30.00	\$300,000.00		
	- 1911	F & P rockfill from dam excavation		30,000	CY	\$8.00	\$240,000.00		
ROW2 Subtotal		<u> </u>	- $+$	- +	- +	\$9,591,000.00			
QUANTITIES					PR	RICES	ψ.,p.21,000.00.		
Y De	Doug Stanton CHECKED			Donaldson		CHECKED BOV	8/17/04		
	ATE PREPARED PEER REVIEW 4/24/04			DATE PREPARED 08/17/04			PEER REVIEW PAR 8/17/04		

FEATURE:			PROJE	PROJECT:						
		Dam and Reserv oir - Active Storage=			Yakima Riv	er Basin	Water Storage C	Options		
_		orks for RCC Dam		REGION	N PN	PRICE	ELEVEL:	Appraisal		
ROW2 -	- Mech	anical					\bvanotte\Desktop\Blac n_1.3MAF Rev 1.xls]S	ack Rock\Biack Rock		
		T			Norman.	· Pena.	_ Lana.	Allfiniar y		
PLANT	PAY ITEM		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
	19	Miscellaneous Metal	ılwork	D8120	3,000	LBS	\$7.00	\$21,000.6		
		Assume misc m	netal in fixed wheel and							
 "		jet flow gate hou								
		Mechanical						 		
		Furnish and install st		D8410	227 500		\$4.00	21.250.000		
	1 .		· · · · · · · · · · · · · · · · · · ·	D8410	337,500	7	\$4.00	\$1,350,000.0		
·	1		one bulkhead 22' x 24' @ 500' head	D8410	160,000		\$4.00	\$640,000.0		
		Furnish and install se	ats and guides	D8410	127,000	LBS	\$6.00	\$762,000.0		
	1	Heating and Ventila		D-8410	·	1	<u> </u>			
!		50'x40'x24' Control			Ĺ'	<u> </u>	[
!	1	Centrifugal fan: I cac		D-8410	<u> </u>	EA	\$2,500.00	\$2,500.0		
!			fm at 0.50 inches w.g. static		<u> </u>					
!			rve, direct drive; 3/4 hp motor		[[]				
!		rated 480 Vac, Three	phase, 60 Hz.							
!	-	- Har for accept			,	[
		Propeller fan assembl		D-8410	i	EA	\$3,000.00	\$3,000.0		
!	J		cfm at 0.50 inches w.g. static			1	f			
		· · · · · ·	1.5 hp motor rated 460 Vac,		,J	1	—			
· J			nclude fan wall mount		}	ı	<u> </u>	-·		
·	f J	housing with motor gr	,uard.			·				
	25	Unit heaters:		D-8410	4	EA	\$750.00	\$3,000.0		
		Electric horizontal dis	scharge rated 7.5 kw.	_		_ 		7e = y = -		
			Hz. (One each corner -18' throw)			- +				
		with wall thermostats				i				
	26	Control damners; All	motor operated, parallel blade,			·				
		low leakage type with		D-8410						
	ı	48" wide x 48" high		+	:					
		36" wide x 48" high			+1	EA .	\$2,500.00	\$2,500.0		
			1 - 1 each		i }	EA	\$1,500.00	\$1,500.0		
			All 16 gauge galvanized steel,	D-8410		-				
	4	4-inch deep frame, 45	degree blades on 4-inch centers,	- -						
		45 percent free area, w	with insect and bird screen:	1		-		·		
		48" wide x 48" high				EA	\$2,000.00	\$2,000.0		
+		36" wide x 36" high	=: === ===: ====:			EA EA	\$1,000.00	\$2,000.00		
	·	ROW2 Subtotal		+ $+$		_ +		 		
			JANTITIES			PR	RICES	\$2,788,500.00		
		·	CHECKED	BY D.). Donaldson	C	CHECKED			
	P. Schlein		Aur		ped	[BOV	8/17/04		
ATE PREP			PEER REVIEW	DATE PREPAI		P'	EER REVIEW	1.104		
4/23/04			<u></u>		08/17/04	1	BOV 8/17/04 PEER REVIEW DAS BINGS			

FEATL			PROJE	PROJECT:						
		Dam and Reservoir oir - Active Storage= 1.3 MAF		Yakima Rív	Yakima River Basin Water Storage Options					
•		forks for RCC Dam	REGION	N PN	PRICE	E LEVEL:	Appraisal			
ROW2 -	- Mechr	anical	FILE:		and Settings\t		Black Rock\Black Rock			
PLANT ACCOUNT	РАУ ПЕМ	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT			
	<u> </u>	Mechanical (cont)								
i]	ĺ	(Continuation of HVAC System)	D-8410				·			
i		(50'x40'x24' Control House)								
					<u></u>	<u> </u>	<u> </u>			
	T I	Fan motor starters: Design, furnish and install control system	D-8410	2	EA	\$2,500.00	\$5,000.0			
		Ductwork: All 16-gauge galvanized steel with extra heavy (ASTM A90 G120) galvanized	D-8410	250	LBS	\$10.00	\$2,500.0			
	. <u>. </u>	coating: Air plenum: 250 lbs.		<u> </u>						
	30	48"x48" galv steel intake air filter frames using ninc(9) 24"x16"x2" disposable filter elements in frame	D-8410	1	EA	\$2,000.00	\$2,000.0			
		with dirty filter differential pressure sensor with warning light and remote signal.		! !						
		16"x24"x2" disposable fiberglass, 30% min efficiency, Filter elements (estimate 9 elements with	D-8410	36	EA	\$25.00	\$900.0			
+		spares for testing, startup and two replacements each.			<u> </u>					
	32	Galv. Steel duct and fan supports.	D-8410	200	LBS	\$10.00	\$2,000.0			
			-							
				-		····				
			++		<u> </u>		<u></u>			
	ROW2 Subtotal						\$12,400.00			
		QUANTITIES			PR	RICES	¥*, · -			
	aul Schleir			Donaldson DED		CHECKED	8/17/04			
ATE PREPARED 4/26/04		PEER REVIEW	DATE PREPA	ARED 08/17/04	P	PEER REVIEW ZON Shirley				

FEATI	FEATURE:			PROJECT:					
Black F	Rock f	Dam and Reservoir			ver Basin	Water Storage	Options		
Large R	leservo	oir - Active Storage= 1.3 MAF							
River O	utlet W	forks for RCC Dam	REGION	N PN	PRICF	E LEVEL:	Appraisal		
			FILE:	C-\Documents	and Settings	\hvanotte\Desktop\B	llack Rock\Black Rock		
ROW2 -	Mecha	anical				m_1.3MAF Rev 1.x[s]			
ᅜ	H.		·			T			
PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
 	-		 '	 					
	f		———	1					
<u> </u>		Mechanical (cont)		 			 		
		Heating and Ventilating	D-8410	 	+	-			
 	<u> </u>	Galleries and Adits Avg X-section 6'x10' = 60 sq-ft	. D.01.		+		 		
ļ I	33	Axial fan:	D-8410	 	2 EA	\$5,000.00	\$10,000.0		
	<u> </u>	Three speed reversible; 9,000 cfm at 1.0 inches w.g.			4	Φυ,υνυ,υυ,	\$10,000.		
		static pressure in high speed mode, 2700 cfm in medium		 			+		
 	ſ <i>""</i>	speed mode; 1800 cfm in low speed mode.		····	+				
it	<u> </u>	speed mode; 1800 ctm in low speed mode. speed mode; adjustable blade; belt drive,			+	'			
i)	1'	speed mode; adjustable blade; belt drive, (or adjustable seed controller if cheaper)			-	-			
ı -)		(or adjustable seed controller if cheaper) 10 bp motor rated 460 volts, three		+	+	<u></u>			
	t '								
		phase, 60 Hz. A-weighted, sound pressure level	<u></u>	1	4				
/ J	(not to exceed 85 dbA.		t					
,	34	Axial fan:	D-8410		- L DA	#2 500 00	+ 		
<i>i</i>	(Two speed reversible; 6,000 cfm at 1.0 inches w.g.	— D-0410	·	3 <u>EA</u>	\$2,500.00	\$7,500.0		
,		static pressure in high speed mode, 1800 cfm in low		ı ·	+				
Γ	()	speed mode; adjustable blade; belt drive,	+	·			·		
	, ···	speed mode; adjustable blade; belt drive, (or adjustable seed controller if cheaper)	-	r	+- '		<u> </u>		
;	i t	3 hp motor rated 460 volts, three	·	r		ļ			
	J		-		<u> </u>	l			
-		phase, 60 Hz. A-weighted, sound pressure level not to exceed 85 dbA.		·	<u> </u>	ļJ	·		
		not to exceed as doA.	+	 -	'	 	ı		
		40-kW Electric duct heaters with controls.	D 9410		+	100,000,00	F		
		(one at each fan -2 operate for inspection only	D-8410	2	EA	\$20,000.00	\$40,000.00		
		for 2700 cfm at 45-deg rise.	-		 	1 +			
		460 Vac, 3-phase, 60 Hz. (One each at each inlet.)				<u> </u>			
		with duct thermostats	-1 -+		 				
		With duct incrmostats		·!	1		· · · · · · · · · · · · · · · · · · ·		
	₃₆	Control dampers: All motor operated, parallel blade,					 		
			D-8410		<u> </u>	<u> </u>			
		low leakage type with edge and side seals: 48" wide x 48" high -	+ +		4	<u> </u>	·		
- +	- +		+		┼	\$2,500.00	\$5,000.00		
		48" wide x 36" high -		5	EA	\$2,000.00	\$10,000.00		
- +	- 37	Continued to All 16 annual manifest to the		J	<u> </u>	ı——	··		
- -		Stationary louvers: All 16 gauge galvanized steel.	D-8410		1		-		
		4-inch deep frame, 45 degree blades on 4-inch centers,		J	1	·	- <u> </u>		
- +	- +	45 percent free area, with insect and bird screen:	1		4				
		48" wide x 48" high -	_	2	EA	\$2,000.00	\$4,000.00		
- +		48" wide x 36" high -	+ +		_EA	\$1,500.00	\$7,500.00		
		ROW2 Subtotal QUANTITIES					\$84,000.00		
		· · · · · · · · · · · · · · · · · · ·			PR	RICES			
BY Pa	· e-kla	CHECKED	BY D.	Donaldson	¢	CHECKED	,		
	aul Schleir	- Frinc		Den		BOV	8/17/04		
ATE PREP.		PEER REVIEW	DATE PREPARED PE			BON 8/17/04 PEER REVIEW DAS SINGON			
	4/26/04			08/17/04	1	· · · · · · · · · · · · · · · · · · ·	Pry Stule.		

FEATI	FEATURE:			PROJ	PROJECT:					
1		Dam and Reserv			Yakima River Basin Water Storage Options					
		Vorks for RCC Dam		REGION	N PN	PRICE	E LEVEL:	Appraisal		
_				FILE:	C:\Documents :	and Settings	\hvanotte\Desktop\P	Black Rock\Black Rock		
ROW2 - ⊢	T	anical					m_1.3MAF Rev 1.xls			
PLANT ACCOUNT	PAY ITEM		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
		isol (cont)								
 		Mechanical (cont)								
		(Continuation of H	VAC System)	D-8410						
	38	Reversing, 3-Ph., Fa		D-8410	5		#2 500 Of	#12 500		
		ı <u></u>	an motor starters : 1 install: control system	D-0410		EA	\$2,500.00	\$12,500.0		
	T		gauge galvanized steel with A90 G120) galvanized	D-8410	3,700	LBS	\$10.00	\$37,000.0		
	 	coating: Air plenum: 250 ft	lbs.							
		48x48 = 45-lb/ft	ft x20 ft 900 lb/fan x2 = 1800-lb t x 10-ft = 380 lbx5 units 1900							
	7		ntake air filter frames using x2" disposable filter elements in frame	D-8410	2	EA	\$2,000.00	S4,000.0		
		1	crential pressure sensor with							
		Filter elements (esti	ble fiberglass, 30% min efficiency, timate 16 elements with artup and two replacements each.	D-8410	128	EA	\$25.00	\$3,200.00		
							<u> </u>			
	42]	Galv. Steel duct and I	fan supports.	D-8410	1,000	LBS	\$10.00	\$10,000.00		
		······································					<u> </u>			
		<u> </u>								
		······································		+++				-·		
								<u></u>		
		ROW2 Subtotal						\$66,700.00		
	QUANTITIES					PR	RICES			
	aut Schleir	in	CHECKED AMA	BY D.). Donaldson ILO		CHECKED			
ATE PREP	PARED 4/26/04		PFER REVIEW	DATE PREPA	ARED 08/17/04	P	GOV PEER REVIEW	lus applos		

FEATURE:			PROJECT:						
		Dam and Re ir - Active Stora			Yakima Riv	River Basin Water Storage Options			
River (Outlet W	orks for RCC D	Dam .	REGION	l PN	PRICE	LEVEL:	EVEL: Appraisal	
ROW2	? - Mecha	anical		FILE:		and Settings/byanotte/Desktop/Black Rock/Black Rik Rock Dam_1.3MAF Rev 1.xls/Summary			
- ½	EM]	THE TAIL THE TEXT THE			
PLANT	PAY ITEM		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT	
		Mechanical (co	ont)						
		FURNISH-AN	D-INSTALL THE FOLLOWING:		 				
		Steel outlet wor	ks pipe, air vent	D8420		<u> </u>			
		i	sed for pipe fabrication:	100420		f			
· ···-			yield stress = 36000 psi						
	- .	(All pipe size	es are inside diameter)			 			
	43	168-inch dia	meter, 1 5/16-inch wall		3,800,000	lbs	\$2.00	\$7,600,000.	
		1450 linear f	eet, 2613 lb/ft						
	44	120-inch dia	meter, 15/16-inch wall		135,000	lbs	\$2.00	\$270,000.	
		100 linear fe							
	45	60-inch diam	neter, 1/2-inch wall,		220,000	lbs	\$2.00	\$440,000.6	
		vertical, for a				J			
	- 	615 linear fee	et, 356 lb/ft						
			·	<u></u>					
	I								
	-		·						
							<u></u>	<u> </u>	
	·		· · · · · · · · · · · · · · · · · · ·			i			
	ŀ	Cotes and Cote	<u> </u>						
	-1+	Gates and Gate Furnish and Ins					<u> </u>		
	1		Roller gate w/controls					· · · · · · · · · · · · · · · · · · ·	
_	'`I		1 control box (in shaft house)	D8420	180,400	LBS	\$8.00	<u> </u>	
	47 1		eel for hoist support	-	10.000				
			nch jet flow gates w/controls		10,000 89,400	LBS LBS		\$40,000.0	
			I control box	···· 	69,400	LDS	\$8.00	\$715,200.0	
	49		et flow gate w/controls and bypass pipe	• + +	30,000	LBS	\$8.00	\$240,000,00	
			control box (in shaft house)				30.00	\$240,000.00	
	ļļ					$- \dotplus$	+		
	<u> </u>	······				_			
i	1	ROW2 Subtotal		_ -				- 	
	QUANTITIES					PR	ICES	+ · · · / · i · · / • · · · · · · · · · · · · · · · ·	
Y	Y Ken Smith, Gary Rood CHECKED		CHECKED	BY D.	Donaldson	C	HECKED BOV 4	K/11/24	
ATE PRE		-	PEER REVIEW	DATE PREPARED PH			CHECKED BOV 8/17/04 PEER REVIEW 2/17/04		
	4/27/04	·			08/17/04		Sm 8/12/04		

FEAT	FEATURE:			PROJECT:					
		Dam and Reservoir	Yakima River Basin Water Storage Options						
		pir - Active Storage= 1.3 MAF					 .		
River O	utlet W	Vorks for RCC Dam	REGION	N PN	PRIC	E LEVEL:	Appraisal		
ROW2	- Electr	ical	FILE:			l Settings\bvanotte\Desktop\Black Rock\Black Rock Rock Dam_1.3MAF Rev 1.xls Summary			
NI YUNT		T			T	T			
PLANT ACCOUNT	PAYITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
<u></u>	·	Electrical							
		This estimate is for 2 ROW control bldgs, one	<u> </u>						
		on top of dam and the other downstream for the					Ť		
·	Ĭ	regulating gates.		<u> </u>					
		Assume bringing power to dam part of unlisted items.							
		Furnish and install the following electrical equipment:			-	···································			
	ļ	Grounding System	D-8430						
	50			6		\$180.00			
 !	. 51	Stranded bare-copper conductor, 4 AWG		250	LF_	\$2.50	\$625.0		
					ļ	-			
	<u> </u>	Conduit System Rigid graph parties	D-8430		ļ				
	52	Rigid steel conduit 3/4-inch		300	<u> </u>				
	53	· · · · · · · · · · · · · · · · · · ·		200	 	\$12.00	\$2,400.0		
		PVC conduit, Schedule 40		100	LF	\$14.00	\$1,400.0		
	54			600	LF	\$10.00	\$6,000.0		
	ļ '	HDPE (High-density polyethylene)	·		⊢ .''	\$10.00	\$6 <u>,000.0</u>		
	55			1,000	LF	\$15.00	\$15,000.0		
<u>-</u>		Conductors & Cable	D-8430		· —	-			
		All cable single conductor, stranded copper	.		<u> </u>		 		
ı	56	12 AWG		1,500	LF	\$0.90	\$1,350.0		
	57	† ·		500	—· ·	\$1.20	\$600.0		
·	58			2,000	LF	\$2.20	\$4,400.0		
	59	I/0 AWG		400	LF	\$2.90	\$1,160.0		
<u> </u>		Electrical Service Equipment	D-8430			· · · · · ·	<u> </u>		
	60			1	EA	\$5,000.00	\$5,000.0		
	61	Meter socket, NEMA 3R, 600V, 3-phase	 		<u>EA</u>	\$1,500.00	\$1,500.0		
	62	Safety switch, heavy-duty, NEMA 3R, fusible 3-wire, 600V, 100 ampere	+		EA	00.000,1\$	\$1,000.00		
+	· [Panelboards & Electrical Distribution Equipment							
— j	63	Panelboard, 3-phase, 480V, 250 ampere				<u> </u>			
	64	Distribution load center, 15 kVA, I-phase			EA -	\$30,000.00	\$30,000.00		
		480-240/120V		Z	<u>EA</u>	\$11,000.00	\$22,000.00		
		ROW2 Subtotal					\$93,515.00		
BY		QUANTITIES				RICES	· ·		
	Mike Schul	CHECKED & Rom'	BY D	D. Denaldson		CHECKED BO√	8/17/04		
ATE PREP	PARED 4/26/04	PEER REVIEW	DATE PREPA	ARED		PEER REVIEW	M alnoy		
		<u> </u>		08/17/04	ı	ı V	10 DE		

FEATURE:			PROJECT:							
1	Black Rock Dam and Reservoir Large Reservoir - Active Storage= 1.3 MAF				Yakima River Basin Water Storage Options					
		oir - Active Storage State Highway 24	= 1.3 MAF	REGION	PNI	PRICE	I EVEL .	Americal		
TOTOGA	lion or c	oldie i nymay 24		rn c.						
SH24 -	Civil			Į.			ngs\bvanotte\Desktop\Black Rock\Black Ro Dam_1.3MAF Rev 1.xls\Summary			
N].	E E									
PLANT ACCOUNT	PAY ITEN		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
	ļ									
		State Highway Re	location (11.8 miles)							
	1	Clear roadway alig	nment	D8140	280	AC	\$3,000.00	 \$840,000.		
	2	Excavation from be		D8140	1,000,000	CY	\$3.50	\$3,500,000.		
	3	Excavation for road	iway (assume 70% rock material)	D8140	5,200,000	CY	\$5.50	\$28,600,000.		
	4	Compacting roadw	ay embankments (subbase)	D8140	5,900,000	CY	\$1.50	\$8,850,000.		
		Furnish and place h		D8140	150,000	TONS	\$16.00	\$2,400,000.		
	6	Furnish and place a	sphalt concrete	D8140	97,000	TONS	\$60.00	\$5,820,000		
							·			
	7	Furnish and install	W-beam type guardrail	D8140	58,000	LF	\$30.00	\$1,740,000.0		
	8	Furnish and install	miscellaneous pipe culverts	D8140	1,800	LF	\$200.00	\$360,000.0		
		Assume 60-inc	h-diameter, wt/ft=100 lbs/ft.							
·		Utility Relocations	within Reservoir Inundation							
	9	Remove Existing T	ransmission Lines	D8440	7	miles	\$50,000.00	\$350,000.0		
		T	-frame wood-pole				\$50,000.00	<u></u>		
		lines, 60-feet at	part					·		
_		954 AWG cond	luctor	_						
	10	Construct Transmiss	sion Lines	D8440	12	miles	\$375,000.00	\$4,500,000.0		
		Two 115-kV H	-frame wood-pole			- Altes	\$575,000.00	\$4,\0,00,00		
		lines, 60-feet ap	part							
		954 AWG cond	uctor							
	11	Install new buried fi	ber optic line along new SH24 ROW	D-8120	12	miles	\$30,000.00	\$360,000.0		
	}	Assume abando						4.700,000.0		
		·				<u> </u>	——· ·——	· ·-		
				·						
	 			-						
		·								
	[s	SH24 Subtotal		_				#F7 720 000 00		
QUANTITIES			PRICES \$57,320,000.0							
Y	Anne Pavot		CHECKED Cho	BY D.	Denaldson OCO	C	HECKED	talal		
ATE PRE			PEER REVIEW	DATE PREPA	10 0 10	P	PEER REVIEW JM 8/17/04			
	4/24/04		<u></u>		08/17/04		1/2 8/1/04			

Black Rock Dam and Reservoir Small Reservoir Active Storage= 0.8 MAF

Field Cost Estimate

FEAT	URE:		PROJE	PROJECT:						
Black	Rock	Dam and Reservoir		Yakima Riv	er Basin V	Vater Storage	ater Storage Options			
Small F	Reservo	oir - Active Storage= 800,000 Acre-Feet	REGION	l PN	PRICE I	LEVEL:	Appraisal			
Summa	ary She	eet 1 of 3	FILE:	C:\Documents a Revisions\ Blac	and Settings\bvanotte\Desktop\Black Rock & Rock Dam_0.8MAF Rev 1.xls]Summar		lack Rock\Black Rock			
F 5	TEM									
PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNITPRICE	AMOUNT			
	ļ	Estimate Worksheets Identify Three Dam Types								
	+	Dam Type 1: Concrete-Faced Rockfill Dam			 	<u> </u>				
ļ		Dam Type 2: Central-Core Rockfill Dam			+					
!	-¦	Dam Type 3: Roller Compacted Concrete Dam								
		DAM TYPE 1: CONCRETE-FACED ROCKFILL					 			
		Includes foundation treatment, dam structure,		· · ·						
		river outlet works, and relocation of State Highway 24.								
	<u> </u>									
		Daml Subtotal			ļ		\$621,530,800.00			
	 	River Outlet Works (ROW1) Subtotal			·		222 000 222 0			
	·	INVERTORIES WORKS (ROWT) SUBJORAL					\$79,000,000.00			
	<u> </u>	Relocation of State Highway 24 Subtotal					\$57,320,000.00			
]						007,520,000.00			
					ļ·· ·					
	<u> </u>	Subtotal					\$757,850,800.00			
		Makifiasis				<u></u>	<u></u>			
	·	Mobilization 5%	(+/-)				\$38,000,000.00			
		Subtotal w/ mobilization								
-	ļ			··			\$795,850,800.00			
		Unlisted Items 10%	(+/-)	· ····			\$84,149,200.00			
	. .	DAM TYPE 1: CONTRACT COST		·						
	-	DILLY TIPE TONI RACT COST	—·] ··—— 				\$880,000,000.00			
		Contingencies 25%	(+/-)				\$220,000,000.00			
		DAM TYPE 1: FIELD COST					\$1,100,000,000.00			
·	<u> </u>			-·{						
					. ——.		<u></u>			
					—					
			-+	· · · · · ·	+	} }-				
			<u> </u>	·	<u> </u> -		·			
			<u> </u>			— — -	···			
			-	_··-			-· · -			
		QUANTITIES			PR	ICES				
BY		CHECKED	BY D.	Donaldson	CH	ECKED	1 41-41			
ATE PRE	PARED	PEER REVIEW	DA're Book	NED.	- -	ER REVIEW	8/14/01			
	PEER REVIEW		DA'TE PREPA	08/17/04	PE	ER REVIEW	ا مامامه			
				V0/17/U4		<i>V</i>	> 20 (LTL) . [

1	łack Rock Dam and Reservoir					PROJECT: Yakima River Basin Water Storage Options						
Small F	all Reservoir - Active Storage⇒ 800,000 Acre-Feet				REGION	l PN	PRICE (PRICE LEVEL: Appraisal				
	ry She	et 2 of 3		<u></u>	FILE:	C:\Documents a Revisions\ Blac	and Settings\bv k Rock Dam_	vanotte\Desktop\ 0.8MAF Rev 1.x	Black Rock\Black Rock Is]Summary			
PLANT	PAY ITEM		DESCRIPTION		сорв	QUANTITY	UNIT	UNIT PRICE	AMOUNT			
		DAM TYPE 2: CI	ENTRAL CORE ROO	CKFILL				· · · · · · · ·				
	-	Includes founda	ation treatment, dam st ks, and relocation of S	ructure,								
		Dam2 Subtotal							\$573,117,150.00			
		River Outlet Works	(ROW1) Subtotal						\$79,000,000.00			
	 	Relocation of State 1	Highway 24 Subtotal						\$57,320,000.00			
		Subtotal	······································					·	\$709,437,150.00			
		Mobilization	· · · · · · · · · · · · · · · · · · ·	5% (+/	-)				\$35,000,000.00			
		Subtotal w/ mobiliza	ntion	·	·· ·····			· ·-	\$744,437,150.00			
		Unlisted Items		10% (+/-	(2)				\$75,562,850.00			
		DAM TYPE 2: CO	NTRACT COST	·		 			\$820,000,000.00			
		Contingencies		25% (+/-					\$180,000,000.00			
	· · ·	DAM TYPE 2: FIE	LD COST					··· · · · · · · · · · · · · · · · · ·	\$1,000,000,000.00			
	-· ·											
				·					· · · · · · · · · · · · · · · · · ·			
	 (<u> </u>										
			····			<u> </u>						
			·		<u> </u>							
		QL	JANTITIES				PR	ICES				
ATE DINK	В			BY D,	Donaldson De D	СН	CHECKED					
ATE PREF	-ARED		PEER REVIEW		DATE PREPA	RED 08/17/04	PE	ER REVIEW	8/17/d1) ps gliz 104			

	FEATURE: Black Rock Dam and Reservoir Small Reservoir - Active Storage= 800,000 Acre-Feet					PROJECT: Yakima River Basin Water Storage Options					
Small R						l PN	PRICE LEVEL: Appraisal				
Summa	ry She	et 3 of 3			FILE:	C:\Documents a Revisions\ Blac	and Settings\bvanote\Desktop\Black Rock\l k Rock Dam_0.8MAF Rev I.xls Summary		lack Rock\Black Rock s]Summary		
PLANT ACCOUNT	PAY ITEM		DESCRIPTION		CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
ļ		DAM TVDE 2. DA	DLLER COMPACTE	a concrete							
· 		Includes found	ation treatment, dam str ks, and relocation of St	ucture,							
		Dam3 Subtotal		·		:			\$980,587,000.		
		River Outlet Works		·					\$22,000,000.		
		Relocation of State	Highway 24 Subtotal			·		· · · · · ·	\$57,320,000.0		
		Subtotal	····			· · ·			\$1,059,907,000.0		
		Mobilization		5% (+/-)				-	\$53,000,000.0		
		Subtotal w/ mobiliza							\$1,112,907,000.0		
		Unlisted Items DAM TYPE 3: CO	NTRACT COST	10% (+/-)					\$87,093,000.0		
_ · ·		Contingencies		25% (+/-)		·		··	\$1,200,000,000.0 \$350,000,000.0		
	-· .	DAM TYPE 3: FIE	LD COST					· -	\$1,550,000,000.0		
				<u> </u>		<u></u>		· .			
				· · · · · · · · · · · · · · · · · · ·							
									—·		
			· ·								
—· ·.} —· ·}											
		QI	JANTITIES				DE	NOTE	····		
Y			CHECKED	[1	BY D.	Donaldson PC/Q	Ic	HICES HECKED	1 9/12/mm		
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FEAT				PROJECT:						
	ack Rock Dam and Reservoir all Reservoir - Active Storage= 800,000 Acre-Feet m Type 1: Concrete-Faced Rockfill Dam m 1 - Civil/Structural				Yakima Rive	r Basin V	Water Storage O	ptions		
				REGIO	PN PRICE LEVEL: Appraisal					
Dam 1.	- Civil/S	tructural		FILE:	C:\Documents an	ck Rock\Black Rock				
	Т	indicidi ai			Revisions\ Black	Rock Dam	_0.8MAF Rev 1.xls]S	Summary		
PLANT ACCOUNT	PAY ITEM		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	: AMOUNT		
	ļ	<u> </u>								
		GENERAL SITEV			ļ			ļ <u></u>		
	_	1	tring and grubbing required		.					
			nprovements and haul roads are			1		ļ		
		part of unl	isted items		ļ	+				
		DIVERSION & DI	EWATERING		-					
	 	1	water is below excavation		 	+				
			stream beds in area are dry		i	 		<u> </u>		
	ļ——	7133HAE ALLEWIZE	sirean oeas in area are ary			-				
	<u> </u>	FOUNDATION EX	CAVATION		· <u></u>	 		·		
		ļ <u> </u>	n material stockpiled for reuse		·		† · ·	·		
			aterial stockpiled for reuse				 			
			be upstream, within 1/2 mile of dam				<u></u>	·		
	1	Excavation, stripping	g, of dam foundation	D8312	315,000	CY	\$2.00	#620.000		
			f stripping 12 inches or less	150312		 	\$2.00	\$630,000.		
			g will be stockpiled for topsoil use			<u> </u>	+			
	2		n, for dam foundation	D8312	23,700,000	CY	\$3.00	\$71,100,000		
	-		5% of volume requires ripping	120312	23,700,000		\$55.00	\$71,100,000.0		
			nined and coarse-grained materials			 	 			
			urately stockpiled			-	 			
	3	Excavation, rock, for		D8312	1,700	CY	\$45.00			
			d blast in random locations		1,700			\$76,500.0		
		FOUNDATION TR	EF A TRATENIE							
			oundation treatment, fault zone	·· ·		ļ	 			
			vindution treatment, fatal zone lidation grouting, and curtain grouting				 			
							i			
		Miscellaneous Foun								
		Applied in areas	of poor quality rock							
				_	-·		ļ			
	- 4	Slush grouting of fou	::	D8312	1 <u>40,000</u>	SF	\$2.00	\$280,000.0		
			0% of area between u/s toe and axis	<u> </u>						
}·		Dental concrete		D8312		CY	\$150.00	\$255,000.0		
	†		sand filter on foundation	D8312	34,000	_ CY	\$28.00	\$952,000.0		
		Assume a 3-ft thi	0% of area between ws toe and axis	 			<u> </u>			
	7 1	 	gravel drain on foundation				·			
_	— ˈ] ː		ilter in a 3-ft thickness	_ D8312	34,000	CY	\$25.00	\$850,000.00		
	I	Dam1 Subtotal	mer in a 5-y mackness		+	— · -	—-·			
	-	QL	JANTITIES			DR	ICES	\$74,143,500.00		
Y		<u> </u>	СНЕСКЕД	RV D. Do	naldson					
ill Gonzale	:5		Bill Eugemoen		den	[CHECKED Bov (8/17/04		
ATE PREJ	PARED		PEER REVIEW	DATE PREP.				CA 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
/12/2004			Bill Engemocn		08/17/04	ľ	PEER REVIEW Jus Stiller			
					· / · · / · • •		V	7" 2"" "		

FEAT			PROJECT:						
		Dam and Reservoir		Yakima Rive	r Basin	Water Storage O	ptions		
		oir - Active Storage= 800,000 Acre-Feet Concrete-Faced Hockfill Dam	BEGIGN	PN PRICE LEVEL: Appraisal					
Dain 1 y	ф е 1.	Concrete-Faced Hockilli Dam	REGION	PN	PRIC	E LEVEL:	Appraisal		
	Civil/S	tructural	FILE:			bvanotte\Desktop\Blac _0.8MAF Rev 1.xls St			
PLANT	РАҮ ПЕМ								
PL,	PAY	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
							···· <u>-</u>		
		FOUNDATION TREATMENT (continued)			1				
		(0000000)	<u> </u>			-			
]	Treatment of south abutment fault area			-				
	8	Extra rock excavation for fault treatment	D8312	135,000	CY	\$13.00	\$1,755,000		
		Assume south abutment is fractured							
	l	Assume excavate with hydraulic excavator			1				
	9	Dental concrete for fault treatment	D8312	4,200	CY	\$140.00	\$588,000.		
	10	Furnish/place zone 2 sand filter downstream of plinth	D8312	50,000	CY	\$28.00	\$1,400,000.		
		Assume a 3-ft thickness, 500' by 1000' area			-				
		Assume same source as listed under embankment				<u> </u>			
	11	Furnish/place zone 3 gravel drain d/s of plinth	D8312	50,000	CY	\$25.00	\$1,250,000.		
		Assume 3-ft thickness, over zone 2 filter							
					- ·				
		Consolidation Grouting of Foundation			-		·		
		Generally limited to area beneath plinth			-	_			
-	12	Sctups for drilling grout holes	D8312	4,170	EA_	\$75.00	\$312,750.0		
		Assume 2-inch dia. drilled on 7.5-foot centers	[<u> </u>		
	13	Drill grout holes	D8312	125,000	LF.	\$15.00	\$1,875,000.0		
		Assume 2-inch dia. w/length= 30 feet			∤				
		Hookups to grout holes	D8312	4,170	EA_	\$60.00	\$250,200.0		
-··· · }	12	Pressure grout	D8312	190,000	CF	\$7.00	\$1,330,000.0		
·		Assume grouting process only minus cement	[
		Assume 2 CF per 1 LF of hole				 			
·		Furnish and handle cement for pressure grouting	D8312	190,000	BAGS	\$8.00	\$1,520,000.0		
		Assume 1 bag per CF							
		Curtain Grouting of Foundation			i	+			
		Two-row curtain beneath plinth	· ·		- ·	·			
	17	Setups for drilling grout holes	D8312	1,330	ΕΛ	\$100.00	\$133,000.0		
		Assume 2-rows of 2-inch dia.on 10-ft centers				† 1700.00			
	18	Drill grout holes	D8312	260,000	LF	\$15.00	\$3,900,000.0		
		Assume 2-inch dia. w/length from 60 to 250 feet				1			
	19	Hookups to grout holes	D8312	1,330	EA -	\$75.00	\$99,750.00		
	20	Pressure grout	D8312	520,000	CF	\$7.00	= \$3,640,000.00		
. <u></u>		Assume grouting process only minus cement		·			45,040,000.00		
	[Assume 2 CF per 1 LF of hole	··			f ·			
	21	Furnish and handle cement for pressure grouting	D8312	520,000	BAGS	\$8.00	\$4,160,000.00		
			<u>_</u>						
		Dam1 Subtotal				<u> </u>			
QUANTITIES					ICES	\$22,213,700.00			
CHECKED		BY D.	Donaldson						
Gil Gonzales Bill Engemoen				BOV 8	17/04				
ATE PREPARED PEER REVIEW		DATE PREPARED PEER REVIEW							
/12/2004			DATE PREPARED 08/17/04 PEER REVIEW 08/17/04			1 alinloy			

FEAT	URE:		PROJECT:						
Black	Rock Dam and Reservoir Reservoir - Active Storage= 800,000 Acre-Feet Type 1: Concrete-Faced Rockfill Dam				r Basin V	Water Storage O	Options		
Small F	Reservo	ir - Active Storage= 800,000 Acre-Feet							
Dam Ty	уре 1: (Concrete-Faced Rockfill Dam	REGION	N PN	PRICE	E LEVEL:	Appraisal		
Dam1 -	- Civil/S	tructural				ovanotte\Desktop\Blace _0.8MAF Rev 1.xls S	ack Rock\Black Rock		
	1	T T T T T T T T T T T T T T T T T T T		Revisious que men.	KOCK Date_,	J.8MAT NEV 1.A.J.	Jummary		
PLANT ACCOUNT	PAY ITIEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
		EMBANKMENT CONSTRUCTION							
	 	ttems are set up as furnish and place, which would		··	1				
	· · · ·	include purchasing from commercial sites,		 	ļ	-			
		processing onsite, development of quarry, or			+	ļ —			
		transporting from stockpiles of required excavation				+	·		
ļ		introporting from society	-	<u> </u>	+				
	22	Furnish and place zone I upstream blanket	D8312	850,000	CY	\$6.00	\$5,100,000.0		
	—	Consists of loess stockpiled from required exc	1		10.		Φυ,100,000		
<u> </u>		within 1/2 mile of dam	1	t	 		·		
ļ		Compaction to 6-inch lifts by tamping roller	·		-				
	23	Furnish and place zone 2 filter	D8312	1,200,000	CY	\$25.00	#30 000 000 		
		Sand/gravel material processed commercially	-	1,200,000		ΨΔ3.QQ	\$30,000,000.0		
	1	or developed onsite		r	 '	\	ł		
	ţ	If commercial, assume 17 mile one-way haul		· ·					
	1	Compacted to 12-inch layers by vibratory steel drum	+	(<u> </u>		
	24	Furnish and place zone 3 drain	D8312	1,200,000	CY	+ 233 00	#37 600 000		
	1	Gravel/cobble material processed commercially or		1,200,000	1 (1)	\$23.00	\$27,600,000.0		
· • •	1	developed onsite			 	+	l		
		If commercial, assume 17 mile one-way haul	+	ı			H		
	f "t	Compacted to 12-inch layers by vibratory steel drum	 	—		├ ── →			
	25	Furnish and place zone 4 rockfill	TD8312			·	1		
		Developed from basalt ridges surrounding reservoir	D8312	47,200,000	CY	\$6.50	\$306,800,000.0		
J	1	Assume average 1-mile haul to dam			 		· · · · · · ·		
	(Rock sizes up to 3-foot	-	!	ł		r		
	(Compacted in 3-fi layers by vibratory steel drum		·		t	····································		
	26	Furnish and place zone 5 coarse grained random fill			- +	<u> </u>			
		Comes from stockpiles of required excavation	D8312	13,150,000	CY	\$4.00	\$52,600,000.0		
	1	Comes from stockpites of required excavation within 1/2 mile of dam	+ +			·			
	()		+				·· ·— · ·—		
		Generally consists of gravelly soils Compacted in 2-ft layers by vibratury steel drawn							
	77	Compacted in 2-ft layers by vibratory steel drum Furnish and place zone 6 fine grained random fill	++		r	<u> </u>	·		
<u> </u>	,—	Furnish and place zone 6 fine grained random fill Comes from stockniles of required execution	D8312	6,100,000	CY	\$4.50	\$27,450,000.0		
 		Comes from stockpiles of required excavation				· }.			
	+	within 1/2 mile of dam Generally convivts of sands/sitts/ataws		}	ļ.				
		Generally consists of sands/silts/clays	1 +				- <u></u>		
•		Compacted to 9-inch layers by tamping rollers				+			
	_ 1		+ -	•	+				
			1 1						
		Dam1 Subtotal	+			+			
		QUANTITIES	+		PRI	ICES	\$449,550,000.00		
SY .		CHECKED	BY D.	D. Donaldson,	-	CHRUZER			
Vill Gonzale		Bill Engemoen		DER	- 1	Bos	V K/17/04		
ATE PREP	PARED	PEER REVIEW	DATE PREPA		P	PEER REVIEW	· A · last		
/12/2004		Bill Engemoen	<u></u> _	08/17/04	_[_	<i>')j</i>	Mas Spurion		

1	ATURE:			PROJECT:						
	k Rock Dam and Reservoir Reservoir - Active Storage= 800,000 Acre-Feet Type 1: Concrete-Faced Rockfill Dam				Yakima River Basin Water Storage Options					
		=		REGION	I PN	PRICE	LEVEL:	Appraisal		
	Civil/Si	tructural					vanotte\Desktop\Black 0.8MAF Rev 1.xlsjSu			
NT UNT	TEM					<u></u>				
PLANT ACCOUNT	PAY ITEM		DESCRIPTION	CODE	QUANTIFY	UNIT	UNIT PRICE	AMOUNT		
	ļ	CONCRETE FACE	& PLINTII CONSTRUCTION							
İ	 -				ļ <u> </u>	_	·			
	† · ·	Plinth		.	····	·				
<u> </u>	_	Typical thickness	will be 1.5 feet		 	+	+			
· · · ·	l <u>-</u>	Width will range f	·		·	 		 ·		
			may be needed in poor rock areas	···						
L						Ī	ļ.			
ļ <u>.</u>		T	forced concrete in plinth	D8312	10,400		\$350.00	\$3,640,000.		
<u> </u>			crete reinforcement (100#/CY)	D8312	1,040,000	LBS	\$0.80	\$832,000.0		
			ment for concrete (.282T/CY)	D8312	2,930	 	\$120.00	\$351,600.0		
	31	Furnish and install grou		D8312	285,000	LF	\$15.00	\$4,27,5,000.0		
		Assume 1-inch dia Assume 15-foot lei	imeter rebar grouted into rock ngths			<u> </u>	ļ			
							· · · · · ·			
		Concrete Deck				<u></u>				
	 		tess from 1 to 2 feet		!					
ļ	 	Adjacent panels wi	ill have waterstops and dowels			Ĺ ļ	ļ			
	32	Furnish and place reinfo	orced concrete in deck	D8312	165,000	CY	\$300.00	#40 500 000 C		
l	i i		rete reinforcement (100#/CY)	D8312	16,500,000	LBS	\$300.00	\$49,500,000.0		
			nent for concrete (.282T/CY)	D8312	46,500	TONS	\$100.00	\$12,375,000.0 \$4,650,000.0		
		·				···				
	<u> </u>	·		-						
		MISCELLANEOUS								
		Instrumentation								
		Assume part of unli	isted items			+]	·		
— -		Toe Drains		_		_ +				
		Assume part of unli	sted items	+ $+$		-				
		Site cleanup and reland	dscaping	+	— —					
		Assume part of unli		_						
	\dashv	-								
				-						
- +	- +			++		-+	+	<u></u>		
	1	Dam1 Subtotal						\$75,623,600.00		
		QUA	NTITIES			PRI	CES	\$75,045,000.00		
SY		C	HECKED	BY D.	Donaldson	C	UNCKED			
Vill Gonzale		Bi	ill Engemoen		ACU_	1	BOV	8/17/04		
ATE PREF	PARED		EER REVIEW	DATE PREPA	RED	P	EER REVIEW JAS	cut.		
/12/2004	····	Bi	III Engemoen		08/17/04	L	'VM	alinho.		

FEATURE:		PROJECT:						
Black Rock Dam and Reser Small Reservoir - Active Storage:			Yakima Rive	r Basin V	/ater Storage C	Options		
Dam Type 2: Central -Core Rock	kfill Dam	REGION	PN	PRICE	LEVEL:	Appraisal		
Dam2 - Civil/Structural		FILE:		nd Settings\bvanot(c\Desktop\Black Rock\B : Rock Dam_0.8MAF Rev 1.xls\Summary				
NT NT								
PLANT ACCOUNT PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
GENERAL SITE	WORK			<u> </u>				
-···	aring and grubbing required				·	<u> </u>		
1	mprovements and haul roads are			T	<u> </u>	i ·		
	listed items			ļ				
DIVERSION & D	EWATERING							
Assume ground	lwater is below excavation							
Assume natura	l stream beds in area are dry							
FOUNDATION E								
	m material stockpiled for reuse							
	aterial stockpiled for reuse							
Stockpiles will	be upstream, within 1/2 mile of dam							
	g, of dam foundation	D8312	320,000	CY	\$2.00	\$640,000.0		
1	f stripping 12 inches or less				·	<u></u>		
	ng will be stockpiled for topsoil use		<u>.</u>					
2 Excavation, commo		D8312	24,200,000	CY	\$3.00	\$72,600,000.0		
1 1	35% of volume requires ripping							
	uined and coarse-grained materials		·					
	arately stockpiled			ļ	<u>. </u>			
3 Excavation, rock, fo Assume drill an	r dam foundation d blast in random locations	D8312	4,200	CY	\$32.00	\$134,400.0		
FOUNDATION THE	DIZA TRANSPAND		·					
	oundation treatment, fault zone			.		<u></u>		
	olidation grouting, and curtain grouting							
Miscellaneous Four	ndation Areas	<u> </u>						
Applied in areas	of poor quality rock	-		·	·· <u> </u>			
4 Slush grouting of fou	indation surface	D8312	140,000		\$2.00	\$280,000.00		
Over assumed I	0% of area beneath zone 1	 				<u>\$250,000.00</u>		
5 Dental concrete		D8312	4,200	CY	\$150.00			
	sand filter on foundation	D8312	34,000	CY	\$28.00	\$952,000.00		
Over 10% of are Assume a 3-ft the	a between zone 1 and d/s toe	I				·		
	gravel drain on foundation	Deala		+	— · [
	filter in a 3-ft thickness	D8312	34,000	_CY	\$25.00	\$850,000.00		
Dam 2 Subtotal	The state of the s		—· — i	· [-		 ,		
	JANTITIES	 	<u></u>		CES	\$76,086,400.00		
CHECKED		BY D.	Danuld					
ill Gonzales	Bill Engemocn	D. D.	Donaldson	ľ	HECKED ROV	8/a/aL		
ATE PREPARED	PEER REVIEW	DATE DEPENDED			PEER REVIEW 8/17/04			
12/2004	Biil Engemoen	DATE PREPARED PEER REVIEW 08/17/04				a skirlor		

FEAT	URE:		PROJECT:							
Į.		Dam and Reservoir ir - Active Storage= 800,000 Acre-Feet		Yakima Rive	r Basin V	Vater Storage (Options			
Dam Ty	/pe 2: •	Central -Core Rockfill Dam	REGION	l PN	PRICE	LEVEL:	Appraisal			
Dam2 -	Civil/S	tructural	FILE:			vanotte\Desktop\Bla 0.8MAF Rev 1.xis}	ek Rock\Black Rock Summary			
FN.	EM									
PLANT ACCOUNT	PAY ITEM	DESCRIPTION	GODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT			
		FOUNDATION TREATMENT (continued)			<u> </u>					
		Treatment of south abutment fault area		<u>. </u>		 				
	8	Extra rock excavation for fault treatment	D8312	135,000	$\frac{1}{\text{CY}}$	\$20.00	\$2,700,000			
		Assume south abutment is fractured			1		42,100,000			
	ļ —	Assume excavate with hydraulic excavator		-	 		·			
	9	Dental concrete for fault treatment	D8312	4,200	CY	\$140.00	\$588,000			
	10	Furnish/place zone 2 sand filter downstream of zone 1	D8312	50,000	·- 	\$28.00	\$1,400,000			
		Assume a 3-ft thickness, 500' by 1000' area	12-32-12		 	φ20.00	\$1,400,000			
		Assume same source as listed under emb.			-	 				
] [Furnish/place zone 3 gravel drain d/s of zone 1	D8312	50,000	CY	\$25.00	\$1,250,000			
		Assume 3-ft thickness, over zone 2 filter				Ψ25.00	31,230,000			
	 :	Consolidation Grouting of Foundation				<u> </u>				
		Generally limited to area beneath zone 1		-	T					
	12	Setups for drilling grout holes	D8312	5,000	EA	\$75.00	\$375,000.			
		Assume 2-inch dia. drilled on 10-foot centers								
	13	Drill grout holes	D8312	150,000	LF	\$15.00	\$2,250,000.			
		Assume 2-inch dia. w/length= 30 feet			Í		<u></u>			
	14	Hookups to grout holes	D8312	5,000	EA	\$60.00	\$300,000.			
	15	Pressure grout	D8312	225,000	CF	\$7.00	\$1,575,000			
		Assume grouting process only minus cement								
		Assume 2 CF per 1 LF of hole								
	16	Furnish and handle cement for pressure grouting	D8312	225,000	BAGS	\$8.00	\$1,800,000,0			
		Assume 1 bag per CF								
 +		Curtain Grouting of Foundation		· ·		——· ———				
		Two-row curtain beneath zone I								
	17	Setups for drilling grout holes	D8312	1,330	EA	\$100.00	\$133,000.0			
		Assume 2-rows of 2-inch dia.on 10-ft centers								
	<u>.</u> 18	Drill grout holes	D8312	260,000	LF	\$15.00	\$3,900,000.0			
·		Assume 2-inch dia. w/length from 60 to 250 feet								
		Hookups to grout holes	D8312	1,330	EA	\$75.00	\$99,750.0			
	20	Pressure grout	D8312	520,000	CF	\$7.00	\$3,640,000.0			
		Assume grouting process only minus cement								
		Assume 2 CF per 1 LF of hole				$\overline{}$	· — ·— –			
	· · 21[1	Furnish and handle cement for pressure grouting	D8312	520,000	BAGS	\$8.00	\$4,160,000.0			
		Assume I bag per CF	-							
	Dam 2 Subtotal QUANTITIES				+		\$24,170,750.00			
			 	<u></u>	PRI	CES	Ψ4-1,170,730.01			
Y fill Gonzale	СНЕСКЕД		BY D.	Donaldson JC V						
	I Gonzales Bill Engemoen FE PREPARED PEER REVIEW			NC D		1500 8/17/04				
ATE PREI /12/2004	AKED	PEER REVIEW Bill Engemoen	DATE PREPARED 08/17/04 CHECKED BOV \$/			us all love				
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FEAT	URE:		PROJECT:						
	Rock Dam and Reservoir Reservoir - Active Storage= 800,000 Acre-Feet upe 2: Central -Core Rockfill Dam				r Basin V	Water Storage O	ptions		
			REGION	N PN	PRICE	E LEVEL:	Appraisal		
Dam2	- Civil/S	Structural	FILE:			vanotte\Desktop\Blac _0.8MAF Rev 1.xls]S			
F	EM								
PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
·	<u> </u>	EMBANKMENT CONSTRUCTION							
		Items are set up as furnish and place, which would		1	<u> </u>		<u> </u>		
		include purchasing from commercial sites,				<u> </u>	1		
<u> </u>	<u> </u>	processing onsite, development of quarry, or			<u> </u>				
		transporting from stockpiles of required excavation		<u> </u>	+	<u></u>			
	<u> </u>			<u> </u>	-	ļ			
<u> </u>	22	2 Furnish and place zone 1 core	D8312	7,500,000	CY	\$8.50	\$63,750,000.		
<u>L</u>		Acquired from source 6 miles from dam		1		!			
 		Compacted to 6-inch lifts by tamping roller		l	T'				
L	23	3 Furnish and place zone 2 filter	D8312	1,170,000	CY	\$25.00	\$29,250,000.		
	<u> </u>	Sand/gravel material processed commercially		i	<u> </u>	<u> </u>			
	_	or developed onsite			1!		I		
	<u> </u>	If commercial, assume 17 mile one-way haul		, ,	<u></u> '				
		Compacted to 12-inch layers by vibratory steel drum		,	1				
	24	Furnish and place zone 3 drain	D8312	1,170,000	CY	\$23.00	\$26,910,000.0		
İ		Gravel/cobble material processed commercially or		,			· <u> </u>		
<u> </u>	l!	developed onsite							
'		If commercial, assume 17 mile one-way haul			[]	1 7			
ı . !	[!	Compacted to 12-inch layers by vibratory steel drum			1	[
	25	Furnish and place zone 4 rockfill	D8312	41,100,000	CY	\$6.50	\$267,150,000.0		
		Developed from basalt ridges surrounding reservoir	1			[
		Assume average I-mile haul to dam	+ -						
!		Rock sizes up to 3-faot	.	1			·		
		Compacted in 3-ft layers by vibratory steel drum	<u> </u>			. — +			
	26	Furnish and place zone 5 coarse grained random fill	D8312	13,350,000	CY	\$4.00			
	<u> </u>	Comes from stockpiles of required excavation	+	13,330,000	, 	ф+.vv	\$53,400,000.0		
	1	within 1/2 mile of dam			<i>i</i>	,-·	···		
	<u> </u>	Generally consists of gravelly soils	+				·		
	[]	Compacted in 2-ft layers by vibratory steel drum	+ +			[-			
	27	Furnish and place zone 6 fine grained random fill	- <u> </u>	7,200,000		\$4.50			
	1	Comes from stockpiles of required excavation	10012		CY	\$4.50	\$32,400,000.0		
	ļ —]	within 1/2 mile of dam			<u> </u>				
	<i></i> -	Generally consists of sands/silts/clays	+						
	i	Compacted to 9-inch layers by tamping rollers	- -		- +	—·			
		Computer to 5 mer myerrey may-reg con-	+_+						
 }			_ [<u> </u>			
	· —		+++						
	Dam 2 Subtotal QUANTITIES		+				\$472,860,000.00		
BY		CHECKED	+			CES			
Vill Gonzale	lac	CHECKED Bill Engemoen	BY D.	Donaldson	C	CHECKED RALL	21-11		
ATE PREI			+	Dell		Dist	8/17/04		
V12/2004	CAREL	PEER REVIEW Bill Engemocu	DATE PREPA	ARED 08/17/04	PF	BEI' EER REVIEW	B alolo4		
				VOLLITOR		<u></u>	יוס ׳		

FEAT	EATURE:		PROJ	PROJECT:						
		Dam and Reservoir oir - Active Storage= 800,000 Acre-Feet			er Basin Water Storag	ge Options				
		Central -Core Rockfill Dam	REGION	N PN	PRICE LEVEL:	Appraisal				
	- Misce	llaneous	FILE:	C:\Documents and Revisions\ Black	nd Settings\bvanotte\Desktor Rock Dam_0.8MAF Rev 1	p\Black Rock\Black Rock 1.xlsjSummary				
NT UNT				,						
PLANT ACCOUNT	PAYITEM	DESCRIPTION	CODE	QUANTITY	UNIT UNIT PRIC	ICE AMOUNT				
	Ī	MISCELLANEOUS								
ļ		Instrumentation								
		Assume part of unlisted items		<u> </u>						
	<u></u>	Toe Drains								
	_	Assume part of unlisted items								
		Site cleanup and relandscaping		<u></u>						
		Assume part of unlisted items		Ī						
				-	-					
				<u></u>		_				
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			+			<u> </u>				
	<u> </u>	<u></u>								
	r -	·								
		Dam 2 Subtotal				\$0.00				
		QUANTITIES			PRICES					
BY Vitl Gonzald	امو	CHECKED Bill Engemoen	BY D	D. Dopaldson	Current	Rod Gladali				
ATE PRE		PEER REVIEW	DATE PREPA	ARED	PEER REVIE	BON 8/17/04				
//12/2004		Bill Engemoen		08/17/04		SN 8/4/0,				

FEAT				PROJECT:						
	Rock Dam and Reservoir Reservoir - Active Storage= 800,000 Acre-Feet Type 3: Roller Compacted Concrete (RCC) Dam				Yakima River Basin Water Storage Options					
Dam Ty	/pe 3: F	Roller Compacted	Concrete (RCC) Dam	REGION	PN PN	PRIC	E LEVEL:	Appraisal		
Dam3 -	Civil/St	ructural		FILE:		-	ovanotte\Desktop\Bla _0.8MAF Rev_l_xls]	ack Rock\Black Rock Summary		
F 19	E E									
PLANT	PAY ITEM		DESCRIPTION	CODE	QUANTITY	UNTT	UNIT PRICE	AMOUNT		
		General Sitework								
	ļ	Clear and Grub rese	rvoir area (not required)							
	L	Roads, haul roads, i	nstrumentation, site cleanup and					T		
<u> </u>	ļ	relandscaping i	ncluded in unlisted items			_				
		Diversion/Dewater	ing during Construction				 			
		Assume ground	water is below excavation.				T			
		Assume natural	stream beds in area are dry.				Ţ. <u> </u>			
	<u> </u>	Foundation Excava	ation and Backfill	—- ŀ ··-						
	-	Strip topsoil an	d stockpile for reuse			 		†		
			le common material for backfill		 -		 	·		
			tle rock material for riprap and erosion pr	otection		 		·		
			d shoot rock for tunnels in ROW]			 			
			excavation	<u> </u>		-	 			
		*** Small dam ~95	% of large dam found, quantities			 	· · · · · ·			
	1	Materials for RCC		 		-		ļ		
		Assume RCC p.	lant set up at dam site and materials	· 		·	 	 		
		trucked to t				 	ļ			
	· · · · · · · · · · · · · · · · · · ·		e sand and aggregates come from	-		-	 	<u> </u>		
			or Yakima river basins and have a			·	 	 		
	1		ce of 17-18 miles ave.			+		<u> </u>		
			shipped by rail to redi-mix plants			-		<u> </u>		
. —			miles ave. distance from site.				 	<u> </u>		
	2		75% large dam H~90% large dam	-		ļ		 -		
		Dam excavation and		D8130		 	 	_		
		-· · ·	kpile (1ft. Thick) (95%)	1 201.50	128,000			#256.000 a		
<u>-</u>			aterial for dam foundation (Cale)		9,900,000	CY	\$2.00	\$256,000.0		
	. 1		m foundation (95%)	\dashv \dashv	99,000	CY	\$3.50	\$34,650,000.0		
			common excavation		99,000		\$13.00	\$1,287,000.0		
	4 I		V on right abutment (95%)	+	5,000	CY	\$22.00			
			n material from excavation (Calc)		4,417,000	CY	\$32.00	\$160,000.00		
			(0110)	+	4,417,000	- ` <u>` </u>	\$3.50	\$1 <u>5,459,50</u> 0.00		
	I	oundation Treatm	ent-Exc. and conc. Treatment (95%)	- - - - - - - 			·. -			
		Extra rock excavation			71,000					
· 1·			outment is fractured	+	_ ·	CY	\$13.00	\$923,000.00		
			with hydraulic excavator	-	· <u>-</u>					
	7[Dental concrete for fa		+						
			eneral foundation treatment	+ $+$	2,400	_CY_	\$150.00	\$360,000.00		
		urnish and handle ce		·	9,500	CY	\$130.00	\$1,235,000.00		
		am 3 Subtotal		+	2,700	TONS	\$120.00	\$324,000.00		
		QL	JANTITIES	<u> </u>		DR	ICES	\$54,654,500.00		
Y		\bigcirc 0	CHECKED /	BY D.	D14-					
D	oug Stante		(XXX)	υ.	Donaldson		CHECKED <i>GO</i>	V Klastal		
ATE PREP	PARED		PEER REVIEW	DATE DDEDA	/ <u>//////</u>	<u>-</u>	20,	- 9/11/09		
	S/I/04 PEER REVIEW		DATE PREPARED OR/17/04 DATE PREPARED OR/17/04 DATE PREPARED OR/17/04			es solution				
			<u> </u>		08/17/04			ν'		

	EATURE:		PROJECT:					
		Dam and Reservoir oir - Active Storage= 800,000 Acre-Feet			: Basin W	Vater Storage Op	ptions	
		Roller Compacted Concrete (RCC) Darn	REGION	N PN	PRICE	LEVEL:	Appraisal	
	· Cívil/S	Structural			d Settings\bva	vanotte\Desktop\Black 0.8MAF Rev 1.xls Su	ck Rock\Black Rock	
P. S.	TEM					1		
PLANT	PAYITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE;	AMOUNT	
	<u></u>	Foundation Treatment - Consolidation grouting	D8130		'			
		0 Setups for drilling grout holes		20,700	EA EA	\$50.00	\$1,035,000.	
j		Assume 2-inch dia. drilled on 10-foot centers	<u> </u>	121 200	 	<u> </u>		
<u> </u>		1 Drill grout holes - 2-in. dia @ 30 ft long	.	621,300	·	\$15.00	\$9,319,500.0	
 !		2 Hookups to grout holes		20,700	1	\$35.00	\$724,500.0	
l '	اجا ا	3 Pressure grout		1,242,600	CF	\$6.50	\$8,076,900.0	
ļ !	·····	Assume grouting process only minus cement			1 1	1	L	
	<u></u>	Assume 2 CF per 1 LF of hole		4		J		
!	141	Furnish and handle cement for pressure grouting	1	1,242,000	BAGS	\$7.00	\$8,694,000.0	
	'	Assume 1 bag per CF		<u></u>	41	.4	ı	
	<u> </u>	4		· '	[]		<u> </u>	
i———/	4	Foundation Treatment-Grout Curtain thru gallery (95%)	D8130	1	11	1		
	157	5 Sctups for drilling grout holes		640	EA	\$100.00	\$64,000.0	
	4	Assume 2-inch dia. Holes on 10-foot centers	<u> </u>	1	ļ J	1]	 !	
	. 10)	6 Drill grout holes		161,500	LF	\$15.00	\$2,422,500.0	
,I	1	Assume 2-inch dia. w/depth ~55% avc H		i <u> </u> !	<u> </u>	<u> </u>		
/	1	Hookups to grout holes	_]	640	EA	\$100.00	\$64,000.0	
	 181	Pressure grout	<u> </u>	323,000	CF	\$7.00	\$2,261,000.0	
	1	Assume grouting process only minus cement	T	·	t	·	·	
	1	Assume 2 CF per 1 LF of hole		·		(
	[19]	Furnish and handle cement for pressure grouting	Τ	323,000	BAGS	\$8.00	\$2,584,000.0	
]	i	Assume 1 bag per CF				,	<u> </u>	
		F&I 4-inch dia, steel pipe nipples (assume 4/drain)	+	2,600	LF	\$60.00	\$156,000.0	
	ıJ	Leveling Concrete for Foundation (95%)	D8130		<u> </u>	,——————————————————————————————————————		
		Assume 6 sack mix, 3-foot thick over footprint	1	254,000	CY	\$200.00	\$50,800,000.0	
		Furnish and handle cement (.282T/CY)	1		TONS	\$100.00	\$7,160,000.0	
		1	1		, 10.5		<u> </u>	
	()	Drill foundation drains from gallery (95%)	D8130 -	+	<i>-</i>	·· +		
		Scrups (assume 10-ft centers)	+	665	EA	00.001		
	1	Drill holes	1	166,000	LF LF	\$100.00	\$66,500.00	
		Assume 4-inch dia. w/length= 33% dam height.	+	100,000	Lr.	\$15.00	<u>\$2,490,000.00</u>	
		Drill formed drains in dam body along U/S face (95%)	D8130					
- T	, —— J	Assume 10-ft ctrs and 6-inch dia.	D0120		—— [-			
	25	Lower gallery - Sctups	+	420				
	. — _	Lower gallery - Holes drilled from gallery upward		89 800	EA _	\$100.00	\$42,000.00	
· †		Upper gallery - Holes drilled from gallery upward Upper gallery - Setups	+	89,800	- LF	\$15.00	\$1,347,000.00	
		Upper gallery - Setups Upper gallery - holes drilled from dam crest to gallery	1-	635	EA	\$100.00	\$63,500.00	
		Apper gattery - notes drifted from dam crest to gamery		135,000	LF	\$15.00	\$2,025,000.00	
					- +		····································	
		Dam 3 Subtotal					\$99,395,400.00	
		QUANTITIES			PRIC	CES		
	Doug Stant	1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	BY D.	Donaldson	CI	HECKED	V 8/17/04	
ATE PREF	5/1/04	PEER REVIEW	DATE PREPA	ARED 08/17/04	Pì	EER REVIEW (16	s alister	

FEATURE: PROJECT:				-				
		Dam and Rese			Yakima Rive	er Basin V	Water Storage C	Options
			ge= 800,000 Acre-Feet					
Dam ıy	ре 3: н	Roller Compacter	ed Concrete (RCC) Dam	REGION	N PN	PRICE	E LEVEL:	Appraisal
Dam3 -	∩iuil/S¹	trostoral		FILE:	CaDocuments an	id Settings\lr	vanotte\Desktop\Bl:	ack Rock\Black Rock
		ructura:		+	Revisions\Black	Rock Dam_u	_0.8MAF Rev 1.xls [5	Summary
PLANT ACCOUNT	PAY ITEM	1	DESCRIPTION	CODE	- CHANGING	PART	THE PRICE	on the late
A P.	PAY		DESCRIPTION	1	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	···			+	 	+		
	'	Construct RCC	Dam	D8130		f	<u> </u>	
ı'	<u> </u>	Assume 275	5 lb/CY cementitious material	<u> </u>	<u> </u>			T
<u>i</u>	[]		% fly ash and 60% cement	1		ļ —		
	[Assume aggr	gregate processed and hauled 15-20 miles	1	<u> </u>	_		
	Ĺ!		nent hauled 20-25 miles	T				
!						<u> </u>	<u> </u>	<u> </u>
<i>!</i>	29	11	est section (same as Large dam)		4,100	CY	\$140.00	\$574,000.0
	Ĺ!	Estimated dir	imensions = 100' x 35' x 30'	<u> </u>	1	†	<u> </u>	
]		Assume conv	vent. Conc. Facing elements	T	[1		-
	1		orporated into thrust block for stilling	1	· ·	+	· · · ·	
			nd control house	+- 1	1		 	
.]	(<u> </u>		lery forming, waterstops, Contraction	1 —		+		
	[]		cing elements, bonding mortar	+	ı · 		 	
	[]	(no grout		+ +	i —	+	f	· · · · · · · · · · · · · · · · · · ·
	<u> </u>	(-	<u> </u>	-	├	
	30	Construct RCC D	Dam (Complete in Place) (Calc)	+ -	16,658,000	CY	\$28.00	\$466,424,000.0
· · · · · · · · · · · · · · · · · · ·			lle cement (.138T/CY)		2,290,500	-	\$90.00	· · · · · · · · · · · · · · · · · · ·
	1		(Assume 1/2-inch thick/lift on all lifts)(75%)	1	731,250	-1	\$70.00	\$206,145,000.0 \$51,187,500.0
	ı J	·	Additional and the second seco	+ +		1		\$51,187,500.0
	i J	 I		1	<u></u>	$ \longrightarrow$		t
		Cast-in-place Co	onventional Concrete (90%)	D8130		+	1 +	
				†= ·		 		Γ —
			slipformed on U/S face	 	180,000	CY	\$100.00	\$18,000,000.0
		Facing elements - :		1	219,600		\$100.00	\$18,000,000.0
	·- ·-		lc cement (.282T/CY)	† —	112,700	1	\$100.00	
				 	1124,	1000	3100.00	\$11,270,000.00
	35 /	FRP Reinforced co	oncrete dam crest		10,100	CY	#250.00 t	
		Assume 1.5 foot th		+	1,616,000	LBS	\$250.00	\$2,525,000.00
			le cement (.282T/CY)	f [·		LBS	\$0.80	\$1,292,800.00
			/ Cestion (120217C1)	\vdash \dashv		TONS	\$120.00	\$336,000,00
	38	FRP Reinforced or	oncrete parapets on dam crest	 		H 07		
· T	··		000 on both u/s and d/s sides	+ +		CY	\$400.00	\$920,000.00
	39 1	F & P reinforcement		f [-	268 000	F. 55		
]			c cement (.282T/CY)	\vdash $+$	368,000	LBS -	\$0.80	\$294,400.00
	-	Ullisti Line initia	Cement (.2821/C1)	t	650	TONS	\$120.00	\$78,000.00
				t :	— —			
- +	+							
— -			·	·—+		,		
+		<u> </u>		<i>i</i>			+	_
-	+		-	ı — -	———			
		Dam 3 Subtotal		·— +				
			QUANTITIES	,—— <u>!</u>		PRI	ICES	\$781,006,700.00
Y		$\overline{\bigcirc 0}$	CVVCCVC	D				
	Ooug Stanto	.on 1	CHECKED SXX	BY D.	Donaldson ([0]	CHECKED by	All obalah
			NEW 8/17/04			V 8/11/04		
	FEPARED PEER REVIEW 5/1/04		FEER REVIEW	DATE PREPAI		PF	EER REVIEW	12/01
	5/1/04			DATE PREPARED OS/17/04 CHECKEN DEV 8/17/04 PEER REVIEW OS/17/04				

	EATURE:		PROJECT:					
		Dam and Reservoir oir - Active Storage= 800,000 Acre-Feet			r Basin V	Water Storage Op	ptions	
		Roller Compacted Concrete (RCC) Dam	REGION	N PN	PRICE	E LEVEL:	Appraisal	
	- Civil/S	Structural	FILE:		_	ovanotte\Desktop\Black _0.8MAF Rev_1.xls]Su	ek Rock\Black Rock	
PLANT	ITEM							
PLA ACCC	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT	
		Construct RCC Dam (continued)	D8130					
	+	Constitution and Constitution of the Constitut	1	<u> </u>	+	+ ;	i	
	41	l Form lower drain/grout gallery/adits within RCC section		6,300) LF	\$50.00	\$315,000.0	
<u> </u>		Assume 6-ft wide x 10-ft high across base of dam					i	
Ĺ	Ī	Assume Symons Panel system for 12" RCC lifts			T			
<u> </u>		Assume ~90% large dam quantity						
l	42	Form upper drainage gallery/adits within RCC section	\top	4,300) LF	\$50.00	\$215,000.0	
<u> </u>	_].	Assume 6-ft wide x 10-ft high across base of dam		<u> </u>	Ť			
<u></u>	Ī	Assume Symons Panel system for 12" RCC lifts		<u> </u>			 i	
i		Assume ~90% large dam quantity	T)	Ī			i	
i	43'	F&I 12-in PVC waterstops for u/s CrJs & facing elements		107,000) LF	\$15.00	\$1,605,000.0	
	'	Assume 135 CrJs @ 50-ft centers (90%)		ſ <u></u>			·	
<u> </u>	44'	F& I Crack inducers @ CrJ's in facing elements	<u> </u>	53,600	LF	\$15.00	\$804,000.0	
	<u></u> '	(Assume 1/2 L of waterstops and 6 ft wide) (90%)		í	T			
- 		Similar to Milltown Hill		<u> </u>				
<u> </u>	. 1							
'	431	F&I Metal crack inducer plates for CrJs in RCC (75%)		4,190,000	LF	\$8.00	\$33,520,000.0	
j	 '	Assume placed every other lift		t'	<u> </u>	1		
	1	Similar to Pueblo Dam		·	<u> </u>			
		Abutment Adits (same as large dam)	D8130	ı ·'	<u> </u>			
		Drill and shoot 16-ft Dia, for adit	D8130					
				1,100	·I →	\$2,500.00	\$2,750,000.00	
		Remove and stockpile rock (assume local stockpile)		15,500	+	\$20.00	\$310,000.00	
!		Furnish and install 2500-10-ft long x 1-inch dia.		12,500	LF	\$60.00	\$750,000.00	
	1-49	A307, 20K rockbolts		300,000		1		
		Furnish and install steel sets (W8 x 48) in crown		200,000	LBS	\$4.00	\$800,000.00	
1		FF & P concrete in adits (6' x 10')		7,300	CY	\$350.00	\$2,555,000.00	
!	1. 21	Furnish and handle cement (.282T/CY)		2,100	TONS	\$120.00	\$252,000.00	
	1				1			
		Grout adits (same as large dam) Setups for drilling grout holes (2 in disholes 10 ft or a	D8130		<u> </u>			
	- 32	Setups for drilling grout holes (2-in dia holes, 10 ft ctrs,		880	EA.	\$100.00	\$88,000.00	
·)	==	and 8 holes per ring) Drill grout holes (2-in die and 1 – 30 ft)	<u> </u>		+			
	-1	Drill grout holes (2-in dia and L=30 ft)	ļ <u>ļ</u>	26,400	LF -	\$20.00	\$528,000.00	
	·	Hookups to grout holes	+	880	EA	\$100.00	\$88,000.00	
	1 25/	Pressure grout (grouting process only minus cement)		52,800	CF	\$8.00	\$422,400.00	
J		Assume 2 CF per 1 LF of hole			<u> </u>	1		
		Furnish and handle cement for pressure grouting	<u> </u>	52,800	BAGS	\$10.00	\$528,000.00	
	1	Assume I bag per CF			 -	i		
· · · }	\vdash	· · · · · · · · · · · · · · · · · · ·	1		i	─ +	_ ·	
		Dam 3 Subtotal	+- +		<i>i</i> —	· · · · · · · · · · · · · · · · · · ·		
		QUANTITIES	+		PR	RICES	\$45,530,400.00	
ву		CHECKED & CHECKED	BY D.	D. Donaldson	lo	CHECKED		
	Doug Stan			Ded		50	N 8/17/04	
DATE PRE		PEER REVIEW	DATE PREPA		J	PEER REVIEW	1.7/04	
	5/1/04	I	ı	08/17/04	Ī	· · · · · · · · · · · · · · · · · · ·	> 2011 AL.	

FEAT	URE:	·		PROJE	£CT:			
		Dam and Reser	rvoir = 800,000 Acre-Feet			r Basin W	Vater Storage C	Options
		_	Concrete (RCC) Dam	REGION	N PN	PRICE	LEVEL:	Appraisal
Dam3 -	- Miscel	llaneous		FILE:	C:\Documents an Revisions\Black	d Settings\by Rock Dam_/	vanotte\Desktop\Bla 0.8MAF Rev 1.xls 5	ack Rock\Black Rock Summary
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PLANT ACCOUNT	PAY ITEM		DESCRIPTION	CODE	QUANTITY	UNTT	UNIT PRICE	AMOUNT
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 		MISCELLANEOU	JS		ļ			
		Instrumentation				1 '		
	 	Assume part of	funlisted items		·	+!		<u> </u>
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- +	Dam 3 Subtotal					- +	<u> </u>	
	QUANTITIES			- 		PRI	CES	\$0.00
Y				BY D.	. Donaldson		HECKED	
	Dick LaFond N.R.O'She			Ded	-	BOV	8/17/04	
ATE PREF	PREPARED PEER REVIEW		DATE PREPARED PEER REVIEW			1 .,		
	5/1/04			DATE PREPARED 08/17/04 PEER REVIEW 08/17/04				5 g 12/09

FEAT	EATURE:				PROJECT:					
		Dam and Reservir - Active Storage=				Yakima Ri	iver Bas	in Water Storage Op	tions	
		orks for Rockfill Dan			REGION	PN	PRICE	E LEVEL:	Appraisal	
	- Civil/S	tructural, Mechanica	al, and Electrical		FILE:	C:\Documents Revisions\[Bla	and Settit sek Rock I	ngs\bvanotte\Desktop\Black Dam_0.8MAF Rev 1.xls]Su	Rock\Black Rock nmary	
PLANT	РАҮ ПЕМ	:	DESCRIPTION		CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT	
			····							
						!				
			or 0.8 MAF Option will books sized for the 1.3MA						ļ	
L		smaner man odder w	orks sized for the 1.5MA	г Орноп.					 	
	1	ROW1 for Rockfill I	Dams (Complete and Inpla	ace)	D8130	1	LS	\$79,000,000.00	\$79,000,000.0	
		Assume cost is 9	05% (+/-) cost for 1.3 MA	F Option						
		1 3MAF (ROW1) Subtotal	<u> </u>	\$83,494,115.00				<u> </u>		
		% of subtotal	<u></u>	0.95						
	ļ	Result (95% of subtotal):		\$79,319,409.25				- -		
		Round (+/-)		\$79,000,000.00						
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i	QUANTITIES						PRICES			
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1	Doug Stan	ton XIX	CHO			Ded		BOV	8/17/04	
DATE PRE			PEER REVIEW	υ	DATE PREPARED PEER REVIEW		1,764			
	5/1/04				DATE PREPARED PEER REVIEW 2 No 2 12 164					

	FEATURE:				PROJE				
		Dam and Reservo			!	Yakima Riv	er Basin	Water Storage Optic	ons
		ir - Active Storage= 8	300,000 Acre-Feet		REGION	PN	PRICE	LEVEL:	Appraisal
Hiver O	utiet W	orks for RCC Dam			WILL WA				
ROW2 -	Civil/S	structural, Mechanica	l, and Electrical			C:\Documents at Revisions\ Black	nd Settings\ cRock Dam	bvanette\Lesktop\Black Re _0.8MAF Rev 1.xls Summ	ek\Black Rock nary
TN:	Į.								
PLANT ACCOUNT	PAY ITEM		DESCRIPTION		CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
			·	·			<u> </u>		
	ļ <u>-</u>	River Outlet Works fo	or 0.8 MAF Option will be sli	ightly			- 		
			orks sized for the 1.3MAF Op						
	1	ROW2 for RCC Dam	(Complete and Inplace)		D8130	1	LS	\$22,000,000.00	\$22,000,000.00
		Assume cost is 9	5% (+/-) cost for 1.3 MAF Or	ption					
	 	ļ					 		
		1.3MAF (ROW2) Subtotal:		\$23,384,515.00 0.95					
	1	% of subtotal Result (95% of subtotal):		\$22.215,289.25	:		_		·
	 	Round (+/-)		\$22,000,000.00					
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QUANTITIES						PRICES			
l 1⊁/V l (≼≋//3\ l		BY 1	Donaldson		CHECKED //a	1 4/2/4			
DATE PRI	Doug Sta	74	PEER REVIEW		DATE DES	NON	-	1,00	8/17/04 8 8/17/04
vaie (Ki	5/1/04		EER REVIEW		DATE PREP	08/17/04		PEER REVIEW ()	s stolon i
						COLLEGE		10	

	EATURE: Black Rock Dam and Reservoir		PHOJECT: Yakima River Basin Water Storage Options					
		Jam and Heservolf ir - Active Storage= 800,000 Acre-Feet					<u></u>	
		State Highway 24	REGION	PN	PRICE L		Appraisal	
SH24 - (Civil		FILE:	CADocuments and Settings\bvanotte\Desktop\Black Rock\Black Rock Revisions\[Black Rock Dam_0.8MAF Rev 1.xls\[Summary]				
PLANT ACCOUNT	РАҮ ІТЕМ	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT	
		State Highway Relocation (11.8 miles)						
	<u>-</u>	Clear roadway alignment	D8140	280	AC	\$3,000.00	\$840,000.00	
		Excavation from borrow	D8140	1,000,000	CY	\$3.50	\$3,500,000.00	
	3	Exeavation for roadway (assume 70% rock material)	D8140	5,200,000	CY	\$5.50	\$28,600,000.00	
···	4	Compacting roadway embankments (subbase)	D8140	5,900,000	CY	\$1.50	\$8,850,000.00	
	5	Furnish and place base course material	D8140	150,000	TONS	\$16.00	\$2,400,000.00	
	6	Furnish and place asphalt concrete	D8140	97,000	TONS	\$60.00	\$5,820,000.00	
·	7	Furnish and install W-beam type guardrail	D8140	58,000	LF	\$30.00	\$1,740,000.00	
	8	8 Furnish and install miscellaneous pipe culverts Assume 60-inch-diameter, wt/ft=100 lbs/ft.	D8140	1,800	LF_	\$200.00	\$360,000.00	
		Utility Relocations within Reservoir Inundation						
		9 Remove Existing Transmission Lines	D8440	·	miles	\$50,000.00	\$350,000.00	
		Two 115-kV H-frame wood-pole			L			
	Ī <u>.</u>	lines, 60-feet apart						
		954 AWG conductor			├ ┈ ┤			
	1(0 Construct Transmission Lines	D8440	12	miles	\$375,000.00	\$4,500,000.00	
		Two 115-kV H-frame wood-pole					·	
		lines, 60-feet apart 954 AWG conductor				···		
		934 A W O COILLIACK						
		I Install new buried fiber optic line along new SH24 ROW Assume abandon existing line.	D-8120	12	miles	\$30,000.00	\$360,000.00	
		Assume wouldn't existing rise						
	-	· · · · · · · · · · · · · · · · · · ·						
				<u>-</u>	<u> </u>		<u> </u>	
	SH24 Subtotal						\$57,320,000.00	
		QUANTITIES			Р	RICES		
ВУ	Anne Pavol CHECKED Anne Pavol		ВҮ	D. Donakison	7	CHECKED B	OV 8/17/04	
DATE PE	ATTE PREPARED 4/24/04 PEER REVIEW			DATE PREPARED OS/17/04 DATE PREPARED OS/17/04 PEER REVIEW OS/17/04				

Black Rock Outlet Facility and **Outflow Conveyance**

 $Q_{(Conveyance)}$ = 2,500 cfs

 $Q_{(Power\ Plant)} = 1,500 \text{ cfs}$

Field Cost Estimate

FEATURE: Black Rock Assessment Study				PROJECT: Yakima River Basin Water Storage Options						
			/ ss, and Switchyard		Yakima River	Basin W	ater Storage O	ptions		
Outflov	v Con	veyance System	- Q= 2,500 cfs	REGION	l PN	PRICE	ICE LEVEL: Appraisal			
Power _l Summai	•	Design Flow - Q=	1,500 cfs	FILE:			anotte\Desktop\Black Rev 1.xls]Summar	ck Rock\Black Rock y		
PLANT ACCOUNT	РАУ ІТЕМ		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
		Paya Outflow Convo	ance System sized for 2,500 cfs.					····		
		Roza Canal Powerplan								
			oes through Powerplant.				·			
			ries by Canal Option.				<u></u>			
		Roza North Defiv	eries by Pumping Plant.							
		Black Rock Outflow (Conveyance Subtotal					\$306,402,600.00		
	Plant - Civil and Stru Plant - Mechanical S Plant - Electrical Sub		tural Subtotal					\$21,069,650.00		
			btotal					\$77,995,800.00		
			otal					\$4,071,085.00		
		Switchyard & Transm	ission Line Subtotal					\$874,000.00		
		Subtotal						\$410,413,135.00		
		Mobilization		5%				\$21,000,000.00		
		Subtotal w/ mobilizati	on					\$431,413,135.00		
		Unlisted Items		10%				\$38,586,865.00		
· · · · · · · · · · · · · · · · · · ·		CONTRACT COST						\$470,000,000.00		
		Contingencies		25%				\$120,000,000.00		
	<u> </u> 	FIELD COST						\$590,000,000.00		
								·		
		QU	ANTITIES				ICES			
BY CHECKED I			D. Donaldson // Elizabeth Tran	<i>W</i>	CHECKED SAV	8/17/04				
DATE PRI	ATE PREPARED PEER REVIEW		DATE PREI	PARED 08/17/04		PEER REVIEW				

Roza C	EATURE: oza Canal Powerplant, Bypass, and Switchyard utflow Conveyance System - Q= 2,500 cfs owerplant Design Flow - Q=1,500 cfs			CT: Yakima River	Basin W	ater Storage O	ptions
			REGION	PN	PRICE	LEVEL:	Appraisal
·		utflow Conveyance		C:\Documents and Revisions\[BR_Rea			ek Rock\Black Rock y
PLANT ACCOUNT	PAY ITEM	DESCRIPTIÓN	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
₹	<u>.</u>		+				
	ļ						
	—	Construct Intake Structure with Fishscreens					
		Assume single level intake at Black Rock Reservoir.			 		
	 	Assume Top of Dead Pool @ El. 1500.0			<u> </u>		
		Civil/Structural					
		Structural Excavation and Backfill					
	\vdash	Assume top 5 feet of excavation is common and the remain	nder is rock			T	
	+-	Excavation of common materials for structures	D8120	1,700	CY	\$12.00	\$20,400.00
<u></u>		2 Excavation of rock for structures (drill & shoot)	D8120	1,000	CY	\$45.00	\$45,000.00
		Assume no backfill.		 			75.00.00
	ļ			<u> </u>			
	 	Construct Fishscreened Intake Structure (incl. Manifold En	casement)				
		Furnish, form, and place reinforced concrete (f'e=4ksi)	D8120	 1, 500	CY	\$400.00	\$600,000.00
		Furnish and place concrete reinforcement. (110#/CY)	D8120	165,000	LBS	\$1.00	\$165,000.00
		Furnish and handle coment	D8120	423	TONS	\$150.00	\$63,450.00
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		Sheet Subtotal QUANTITIES	+		PF	IICES	\$893,850.00
יייי	Dick Lal		 	D Desuldana		· · · · · · · · · · · · · · · · · · ·	
BY	6/3/04	1000	ВУ	D. Donaldson		CHECKED	8/17/04
DATE PR			DATE PREI	PARED		PEER REVIEW	5 F 1 1 4 1 2
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FEATL	EATURE: loza Canal Powerplant, Bypass, and Switchyard		PROJECT:						
		Powerplant, Bypa veyance System			Yakima River Basin Water Storage Options				
		Design Flow - Q=		REGION	PN	PRICE	LEVEL:	Appraisal	
		tflow Conveyance			C:\Documents and Settings\bvanotte\Desktop\Black Rock\Black Rock Revisions\BR_Roza PP_1500 Rev 1.xls]Summary				
PLANT	МЭЛ ТРМ		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT	
		Construct Intake Str	ucture with Fishscreens				-		
		Mechanical							
	6	Fish screen, radius = 2	20 ft, 90 ft long half cylinder shape	D-8410					
		structural steel weight			104,000	LBS	\$4.00	\$416,000.00	
		stainless steel weight	· · · · · · · · · · · · · · · · · · ·		70,000	LBS	\$15.00	\$1,050,000.00	
	7		tem, 250 psi working pressure	D-8410	60,000	LBS	\$4.00	\$240,000.00	
	. <u></u>	a. 30,000 gallon recei	its, each 30 hp, 87 cfm @ 250 psi		1,200	LBS	\$20.00	\$24,000.00	
		@ 600 lbs each, two			1,500				
		c. 6" dia. piping and t			10,000	LBS	\$7.00	\$70,000.00	
	8	Bulkhead gates and fra		D-8410	144,000	LBS	\$4.00	\$576,000.00	
		(assumes four - 10' by	10' bulkhead gates)			<u> </u>			
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				·		·			
			Sheet Subtotal					\$2,376,000.00	
		QU	ANTITIES			PF	RICES		
BY R. Christensen CHECKED AMC		вч і	D. Donaldson ALQ		CHECKED	OV 8/17/04			
		DATE PREPARED PEER REYEW							
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FEAT	ATURE:		PROJECT:					
			pass, and Switchyard n - Q= 2,500 cfs		Yakima River	Basin V	Vater Storage C	ptions
Power	plant [Design Flow - C	=1,500 cfs	REGION	l PN	PRICE	LEVEL:	Appraisal
Black R	ock Out	flow Conveyance		FILE:			vanotte\Desktop\Bla 0 Rev 1.xls Summa	ck Rock\Black Rock
PLANT	PAY ITEM		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Construct Tunnel	····					
		Construct 90,000-ft	long, 17.00-ft finished diameter, 19.67-ft i	ninimum bor	e diameter, tuni	iel in roc	k. Tunnel will b	ю
		excavated with TBI	M and driven uphill. Water problems will I	be minimal.	Funnel has three	final su	pport reaches.	
		80,600-ft long unre	inforced concrete lined reach					
	9			D-8140	80,600	lf	\$1,200.00	\$96,720,000.0
		(907,000 cy, ap	ppr 11 cy/lf)					
	10	Furnish and pla	ace unreinforced concrete tunnel lining	D-8140	229,000	су	\$350.00	\$80,150,000.00
		Cementitious r	naterials for concrete tunnel lining	D-8140	64,600	tons	\$100.00	\$6,460,000.00
	12	Furnish & inst	all 3/4-in dia, 8-ft long rock bolts	D-8140	642,000	lin ft	\$55.00	\$35,310,000.00
	2 000-ft long reinforced o		reed concrete lined reach					
	13	Excavation		D-8140	2,000	Iſ	\$1,200.00	\$2,400,000.00
		(22,500 cy, app	or II cy/lf)		· ····· ····· ··· ···		·	
	14		ace reinforced concrete tunnel lining	D-8140	5,690	су	\$350.00	\$1,991,500.00
	15	Cementitious r.	naterials for concrete tunnel lining	D-8140	1,600	tons	\$130.00	\$208,000.00
	16	Furnish and ins	stall concrete reinforcement	D-8140	81,700	lbs	\$1.00	\$81,700.00
	17	Furnish and in	stall structural steel tunnel supports	D-8140	828,000	lbs	\$4.00	\$3,312,000.00
	 	7,400-ft long steel l	ined portal reach					
	18	Excavation		D-8140	7,400	lf	\$1,200.00	\$8,880,000.00
[(83,300 cy, app	or 11 cy/lf)					
		Steel Tunnel Liner:	·					
		ASTM A572 (Gr. 50: Sy = 50 kpsi St = 65 kpsi					<u> </u>
	19	204" Dia., 7/8" wali	l, L= 7770 ft., 1916 lbs/ft	D-8420	19,200,000	LBS	\$2.00	\$38,400,000.00
	20	Furnish and pla	ce backfill concrete	D-8140	21,100	су	\$300.00	\$6,330,000.00
	21	Cementitious n	naterials for backfill concrete	D-8140	5,940	tons	\$120.00	\$712,800.00
	22	Furnish & insta	all 3/4-in dia, 8-ft long rock bolts	D-8140	89,600	lin ft	\$55.00	\$4,928,000.00
	23	Furnish and ins	stall structural steel tunnel supports	D-8140	415,000	lbs	\$4.00	\$1,660,000.00
<u> </u>	Sheet Subtotal					\$287,544,000.00		
<u> </u>	QUANTITIES			_		PI	RICES	
BY		ipson (D-8140)	CHECKED MA (D. 8. 94)	BY	D. Donaldson		CHECKED	Ad 11 = 11
Nathan Nakamoto (D-8420) Rick Frisz, D8420			NIX			00 8/17/04		
DATE PR	1		DATE PREPARED PEER REVIEW		/			
	5/26/04				08/17/04		<u> </u>	

FEATU	EATURE:		PROJECT:				
		Powerplant, Bypass, and Switchyard veyance System - Q= 2,500 cfs		Yakima River	Basin W	Vater Storage O	ptions
		Design Flow - Q=1,500 cfs	REGION	N PN	PRICE	LEVEL:	Appraisal
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		iflow Conveyance	+	T		Т	<u> </u>
PL AN AC	; > = 4	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
						T	
		Construct Surge Shaft					
		Construct 530-ft deep, 40.0-ft finished diameter, 46-ft excavated		shaft in rock.	<u> </u>	<u> </u>	
]	'	Shaft will be excavated by raise bore and slash method (drill & b					
<u></u>		Water problems will be minimal. Shaft has two final support rea	iches.				
	24		D-8140	430	lf	\$17,000.00	\$7,310,000.00
 	25	(26,500 cy, approx. 62 cy/lf) Furnish and place unreinforced concrete shaft lining	D-8140	6,450	су	\$400.00	\$2,580,000.00
	26	Cementitious materials for concrete shaft lining	D-8140	1,820	tons	\$130.00	\$236,600.00
	27	Furnish & install 1-in dia, 12-ft long rock bolts	D-8140	21,000	lin ft	\$60.00	\$1,260,000.00
		100-ft deep reinforced concrete lined shaft top reach					
	. 28	(6,160 cy, approx. 62 cy/lf)	D-8140	100	lf	\$17,000.00	\$1,700,000.00
	29	Furnish and place reinforced concrete shaft lining	D-8140	1,500	cy	\$400.00	\$600,000.00
	30	Cementitious materials for concrete shaft lining	D-8140	423	tons	\$150.00	\$63,450.00
	31	Furnish and install concrete reinforcement	D-8140	18,700	lin ft	\$1.00	\$18,700.00
	32	Furnish & install 1-in dia, 12-ft long rock bolts	D-8140	4,800	lin ft	\$60.00	\$288,000.00
	33	Furnish and install chain link protection	D-8140	76,600	sqryd	\$20.00	\$1,532,000.00
		The Land Court Cou					**************************************
TNAUC		Black Rock Outflow Conveyance Subtotal	PRICES				\$306,402,600.00
			1	D. Donaldson		CHECKED	01 8/17/04
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	Canal		, Bypass, and Switchyard	PROJE		er Basin '	Water Storage	Options	
			/stem - Q= 2,500 cfs // - Q=1,500 cfs	REGION	l PN	PRICE	LEVEL:	Appraisal	
Civil/Si		200igii 1 101	- 1,000 dio	FILE:	C:\Documents ar	id Settings\		ack Rock\Black Rock	
PLANT ACCOUNT	PAY (TEM		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT	
<u></u>		Access Road	(60 ft of 24ft wide bituminous surface):						
	- t	Clear roadway	/ alignment	D8120	1,440	SF	\$1.00	\$1,440.0	
			lace base course material (9-inch depth)	D8120	75	TONS	\$20.00	\$1,500.0	
	+	 	lace asphalt concrete (6-inch depth)	D8120	55	TONS	\$100.00	\$5,500.0	
			(6" asphalt concrete surface) F.O Yard= El 1176.0				ļ		
	4	Strip and clear	r pumping plant site to 1 foot depth	D8120	8,000	CY	\$5.00	\$40,000.00	
		·	avation to Yard (25% Strip & Clear)	D8120	2,000	CY	\$7.00	\$14,000.00	
	6	Place and com	ppact embankment for yard (25% Exc.)	D8120	500	CY	\$12.00	\$6,000.00	
	7	Furnish and p	lace base course material (6-inch)	D8120	4,700	TONS	\$20.00	\$94,000.00	
	8	Furnish and p.	face asphalt concrete (6-inch)	D8120	5,200	TONS	\$100.00	\$520,000.00	
	9	Furnish and in	stall 7-foot chain link fence for PP Yard	D8120	2,000	LF	\$20.00	\$40,000.00	
	10	Furnish and ir	stall 7-foot x 24-foot access gates	D8120	3	EA	\$3,500.00	\$10,500.00	
	-							· · · · · · · · · · · · · · · · · ·	
	-	t	ring Construction:			<u></u>			
			need to pass 900 cfs canal flow during		· · · · · - · - · · · · · · · · · · · ·				
ļ			ion. Assume local borrow.						
ŀ	.		to dewwatering required.						
			& D/S earth cofferdams. (Height=15 ft)	D8120	2,000	CY	\$15.00	\$30,000.00	
ŀ			us geomembrane on cofferdams.	D8120	350	SY	\$15.00	\$5,250.00	
<u> </u>	13	1	dia. X .138-in galv., corrugated metal pipe erdams. Wt/Ft= 210 lbs/ft.	es D8120	1,000	LF	\$500.00	\$500,000.00	
	14	Remove coffe	rdams and diversion structures	D8120	1	LS	\$20,000.00	\$20,000.00	
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<u> </u>	1	<u></u>	Sheet Subtotal QUANTITIES			D	RICES	\$1,288,190.00	
BV.	Tall-1- 1- 11	' d	• • • • • • • • • • • • • • • • • • • •	- 		P1			
BY	Dick Laf	ond	M.R.O.Shu	ВУ	D. Donaldson		CHECKED BY	8/17/04	
DATE PR	REPARED		PEER REVIEW	DATE PREI	PARED		PEER REVIEW		
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	Canal I	Powerplant, Bypass, and Switchyard sveyance System - Q= 2,500 cfs	PROJECT: Yakima River Basin Water Storage Options					
		Design Flow - Q=1,500 cfs	REGION	N PN	TPRICE	E LEVEL:	Appraisal	
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PLANT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNII	UNIT PRICE	AMOUNT	
	+	<u> </u>	+					
		Tailrace Channel Excavation			<u> </u>			
L	'	T.O Ground El. 1176. Assume T.O. Rock El. 1150			<u> </u>		<u> </u>	
	<u> </u>	Assume stockpile rock and common material for reuse.						
	1	Common excavation for tailrace channel	D8120	44,500		\$5.00	 	
	16	Rock excavation for tailrace channel (drill and shoot)	D8120	25,000	CY	\$32.00	\$800,000.00	
 			-		 			
		Structural Excavation and Backfill (Powerplant & Bypass)				1		
		T.O Ground El. 1176. Assume T.O. Rock El. 1150		<u> </u>				
		Assume stockpile rock for later use as riprap.						
	17	7 Common excavation for structures	D8120	24,700	CY	\$12.00	\$296,400.00	
	1	Rock excavation for structures (drill & shoot)	D8120	22,000	CY	\$32.00	· · · · · · · · · · · · · · · · · · ·	
		Furnish backfill for structures (reuse excavation)	D8120	6,400		\$6.00	· -	
		Place backfill around structures	D8120	6,400	СУ	Included above	 	
	21	Compact backfill around structures	D8120	6,400	CY	\$8.00	-	
<u> </u>	ļ'		.] '			T		
	_	Pipe Trench Excavation and Backfill		<u>[</u> /				
	,	Manifold excavation in yard.	<u>'</u>	<u> </u>				
		T.O Ground El. 1176. Assume T.O. Rock El. 1150				.!	<u></u>	
<u></u>		2 Common excavation for pipe in Service Yard	D8120	18,000	CY	\$10.00	\$180,000.00	
	24	Furnish, place, & compact backfill for pipe (local)	D8120	11,500	CY	\$6.00	\$69,000.00	
<u></u>	<u> '</u>	<u> </u>	 '	<u> </u>	1	<u> </u>		
L	<u> </u>		_ /			<u> </u>	İ	
	!			ļI			 	
	. !	Pipe Trench Excavation and Backfill		ļ J	1			
·	.	From Tunnel Portal (Sta. 910+00) to Yard (Sta. 940+00)	.	 		ļ	ļ	
	25	Assume all common excavation	1	107 000	C37			
į ·		Common excavation for pipe	D8140	487,000	CY	\$5.00	\$2,435,000.00	
	1	Furnish backfill for pipe	D8140	461,500	CY	Included above		
· ·	1 1	Place backfill around pipe Compact pipe backfill (F&P included in above items)	D8140	461,500 36,000	CY	\$3.00	\$1,384,500.00	
-		Compact pipe backfill (reer included in above terms)	D8140	36,000	CY	\$3.00	\$108,000.00	
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	<u> </u>	Sheet Subtotal			·		\$6,289,000.00	
		QUANTITIES			Р	RICES		
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FEATURE: Roza Canal Powerplant, Bypass, and Switchyard			PROJECT: Yakima River Basin Water Storage Options					
		veyance System - Q= 2,500 cfs		Takilla Kirt	# Dasin	Water Sun age 🗸	ptions	
		Design Flow - Q=1,500 cfs	REGION	N PN	PRICE	LEVEL: A	Appraisal	
Structur	ral and i	Architectural	FILE:			bvanotte\Desktop\Blac 00 Rev 1.xls Summary		
PLANT ACCOUNT	PAYITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT	
		STRUCTURAL				1		
		STRUCTURAL	+		-	 	_	
		Construct Concrete Tailrace Lining and Retaining Walls	+			· · · · · ·		
·		Assume lining is 1-foot thick w/ #6@12" EW EF, 1.5:1 side	.i ≥ slopes					
i	29	Furnish, form, and place reinforced concrete lining	D8120	2,100	CY	\$400.00	\$840,000.00	
		in excavated channel (fc= 4 ksi)	†		<u> </u>			
	30	Furnish, form, and place reinforced concrete walls	D8120	1,800	CY	\$400.00	\$720,000.00	
		Furnish and place concrete reinforcement.	D8120	500,000	LBS	\$0.80	\$400,000.00	
		Assume 130 #/CY	†				· · · · · · · · · · · · · · · · · · ·	
	32	Furnish and handle cement (.282T/CY)	D8120	1,085	TONS	\$140.00	\$151,900.00	
			ļ					
<u> </u>	 -	Construct Powerplant and Bypass Substructure			<u> </u>			
<u> </u>	-11	Furnish, form, and place reinforced concrete	D8120	15,500	CY	\$350.00	\$5,425,000.00	
'	34	Furnish and place concrete reinforcement.	D8120	1,860,000	LBS	\$0.65	\$1,209,000.00	
·	. !	Assume 120 #/CY	.	.[ļ <u>'</u>			
	35	Furnish and handle cement (.282T/CY)	D8120	4,370	TONS	\$120.00	\$524,400.00	
	36	Construct Powerplant and Bypass Superstructure	D8120	15,620	SF	\$100.00	\$1,562,000.00	
'	'	212.5-ft x 73.5-ft x 42-ft high superstructure	No.	1,	<u> </u>	7.22	Ψ1,000,	
		Structural steel superstructure with CMU walls.			'			
i	 	Stepped columns for 90T crane support	†		<u> </u>	l		
i '	'	Built-up roof on metal roof deck.	1 7	'				
		Duni up 1001 of 1011						
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		Sheet Subtotal	ļ			<u>_</u>	\$10,832,300.00	
		QUANTITIES			Pſ	RICES		
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		n. R. O. Show		Dep_		BoV	8/17/04	
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ESTIMATE WORKSHEET

FEATURE: Roza Canal Powerplant, Bypass, and Switchyard				PROJECT: Yakima River Basin Water Storage Options						
Outflow Conveyance System - Q= 2,500 cfs Powerplant Design Flow - Q=1,500 cfs				2501011		lanzou:	- CTIEN	A ' 1		
Power	rplant l	Jesign Flow - Q:	=1,5UU CTS	REGION FILE:	_			Appraisal		
Structu	ral and	Architectural					ovanotte\Desktop\B1 00 Rev 1.xls Summa	ack Rock\Black Rock rry		
PLANT ACCOUNT	PAY ITEM		DESCRIPTION	CODE	QUANITTY	UNIT	UNIT PRICE	AMOUNT		
		STRUCTURAL (co	ont.)				1			
		Construct Pipe Enc	asements in Yard					·		
	37		lace reinforced concrete	D8120	3,100	CY	\$400.00	\$1,240,000.00		
		Furnish and place co	ncrete reinforcement.	D8120	341,000	LBS	\$0.80	\$272,800.00		
! 	39	Assume 110 #/0 Furnish and handle of		D8120	874	TONS	\$140.00	\$122,360.00		
		Structural Steel		50100	175 000			#700 000 00		
	40		ructural steel (painted): irder, rail, and monorail support frame	D8120 es.	175,000	LBS	\$4.00	\$700,000.00		
		Does not includ	e typ. building framework.							
		Miscellaneous Meta		50120	45.000			### 000 pg		
	41		hiscellaneous metalwork , hatches, ladders, guardrail, and	D8120	45,000	LBS		\$315,000,00		
		cable trays								
	42	Motor-operated, exte	rior insulated roll-up door	D8120	1	EΛ	\$10,000.00	\$10,000.00		
		18' x 20'					· · · · · · · · · · · · · · · · · · ·			
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	1	Plant - Civil and St	ructural Subtotal					\$21,069,650.00		
		Q	UANTITIES			Pi	RICES			
вү	Dick Laf	fond	CHECKED M.R. O'Sha	BY i	D. Donaldson		CHECKED 18⁄0 √	8/17/04		
DATE PR	REPARED 6/5/04		PEER REVIEW	DATE PREP			PEER REVIEW	·		
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FEATURE: Roza Canal Powerplant, Bypass, and Switchyard				PROJECT: Yakima River Basin Water Storage Options						
Roza	Canal	Powerplant, By	pass, and Switchyard		Yakima River	Basin W	ater Storage Op	otions		
Power	w Corr rpìant I	veyance Syster Design Flow - Q	n - Q= 2,500 cfs e=1,500 cfs	REGION	PN	PRICE	LEVEL:	Appraisal		
	•	J		FILE: CADocuments and Settings\byanotte\Desktop\Black Rock\Black Rock						
Mechar	nical			 	Revisions\ BR_,Ro	za PP_1500	Rev 1.xls Summary			
PLANT	PAY (TEM		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRKIE	AMOUNT		
	1									
		Major Mechanica	l Equipment	 						
		Turbine Weight		D8420	210,000	LBS	\$20.00	\$4,200,000.00		
		CF3 18-8 Stainless	Runner 6.8' dia.	 						
		Turbine-Vertical Fr	rancis, 52,419 Hp							
		327.27 rpm, 339 ft.	Design Head			ļ				
	2	Digital Governor, 1	80,338 ftlbs.	 D8420	1	EA	\$275,000.00	\$275,000.00		
		1,000 psi system				l				
				 		L				
	3	Governor Pressure	Tank 875 Gal., piping	D8420	7,640	LBS	\$10.00	\$76,400.00		
		and appurtenances.	Look to Flaming Gorge							
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		 	Sheet Subtotal	 		 		\$4,551,400.00		
 	1	1	QUANTITIES			DE	RICES	φ4,551,400.I/I		
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ľ	T.J Turn	age	CHECKED John Brooks	BY 1	D. Donaldson		CHECKED BOV	8/17/04		
DATE DO	opp. nov			 EN A 19190 FARAGOS	<i>V~/∨~</i>			4.00.		
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	EATURE: loza Canal Powerplant, Bypass, and Switchyard				PROJECT: Yakima River Basin Water Storage Options						
					Yakima River	Basin W	ater Storage Op	tions			
			m - Q= 2,500 cfs	REGION	PN	PDICE	LEVEL:	Appraisal			
Power Mechar		Design Flow - C	FILE: CADocuments and Settings/byanotte/Desktop/Black Rock/F Revisions/JBR_Roza PP_1500 Rev Lxts/Summary								
_		<u> </u>									
PLANT ACCOUNT	PAY ITEM		ORSCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT			
	<u> </u>										
	-	Furnish and insta	Il the following:								
_ ·	.	Steel Penstock:	·				-				
		·	or pipe fabrication:					<u> </u>			
		ASTM A36:									
	} .		e inside diameters)								
	4		" wall, L= 4,993 ft., 4265 lbs/ft		21,300,000	LBS	\$2.00	\$42,600,000.0			
	5	84" Dia., [3/16" w	all, L= 492 ft., 737 lbs/ft		363,000	LBS	\$2.00	\$726,000.0			
							<u></u>				
	·	Stainless Steel Sti	lling Basin for Sleeve Valves:								
	"	-	inless steel plate		· · · · · · · · · · · · · · · · · · ·	·					
		·· [<u> </u>				
	6	Four - 396" Dia., I	1/4" wall cylindrical tanks with baseplates:] .				
		Each tank heig	ght = 20 feet								
		Total weight t	or four tanks = 1,180,000 lbs.	D8420	1,180,000	LBS	\$15.00	\$17,700,000.0			
	-			.							
<u> </u>		Closes values with	hydraulic operators:	1							
	 	+	nlet X 72" Dia. Outlet Valves	D8420	280,000	LBS	\$15.00	\$4,200,000.0			
ŀ	· '	· · · · · · · · · · · · · · · · · · ·	Stainless steel plate		200,000		\$15.00				
	1		veight = 70,000					·· 			
		t	for four valves = 280,000 lbs.								
				_							
			with hydraulic operators:		2.2.22			***********			
	8	Sleeve valve guard		D8420	240,000	LBS	\$10.00	\$2,400,000.0			
	-	60,000 lbs. pe	herical valves with hydraulic operators			•		· · · · · · · · · · · · · · · · · · ·			
	-	00,000 103. рс	1 74170					··· <u></u>			
<u> </u>	- 	Turbine guard va	lve				·				
l	9		pherical valve with hydraulic operator	D8420	180,000	LBS	\$10.00	\$1,800,000,1			
		180,000 lbs. p			·			ii '			
					· · · · · · · · · · · · · · · · · · ·		<u></u>				
	Ī										
		ļ	Sheet Subtotal					\$69,426,000.0			
			QUANTITIES			P.	RICES				
ВУ	Nathan 1	Nakamoto, D8420	CHECKED	BY I	D. Donaldson		CHECKED				
			Rick Frisz, D8420		DED	13		8/17/04			
DATE PR				DATE PREP	ARED		PEER REVIEW				
	5/26/04	1			08/17/04		<u> </u>	<u></u>			
							//				

-	URE:	Powerplant Bur	PROJECT: Yakima River Basin Water Storage Options						
Outflo	w Con	veyance Systen							
Outflow Conveyance System - Q= 2,500 cfs Powerplant Design Flow - Q=1,500 cfs				REGION	PN	PRICE	LEVEL:	Appraisal	
Mecha	nical			,	C:\Documents and Settings\bvanotte\Desktop\BI Revisions\ BR_Roza PF_1500 Rev 1.als\ Summare CODE QUANTIFY UNIT UNIT PRICE			Rock\Black Rock	
T.	Ę								
PLANT ACCOUNT	PAY ITEM		DESCRIPTION	CODE	QUANTIFY	UNIT	UNIT PRICE	AMOUNT	
									
	1								
	10	Furnishing and insta	alling one 90-Ton	D-8410	157,500	LBS	\$6.00	\$945,000.0	
		overhead crane, 67.	5' span					-	
			alling Hydraulic elevator	D-8410		unit	\$400,000.00	\$400,000.00	
-					*		0.100(0.000		
<u> </u>		capacity = 3500 pou							
		landings = 3, speed	= 100 f/min.				-		
		D 111 - 1		D-8410	31,000	LBS	\$4.00	\$124,000.00	
	12		guides at turbine (steel)	D-3410	,11,000	<u>LD3</u>	34.00	\$124,00g.00	
		(assumes 3 bays of	guides and 3 hulkhead gates)						
	12	Name and the sing form		D-8410	1,500	LBS	\$20.00	\$30,000.00	
			oulkhead gate, electric wire rope,	. D-8410		LDD	\$20.00	\$50,000.00	
		motorized trolley, 5	-ton capacity						
<u> </u>		Camplage Diffice box	nm & guides at sleeve valves	D-8410	152,000	LBS	\$4.00	\$608,000.00	
	_	*		D-8410	1.72,000		Ψ1.00		
		eight bays to guides	s, 2 bays of stoplogs (steel)						
		CO2 Umb Browner	Fire Extinguishing System:	D-8410	I	L.S.		\$36,000.00	
				D-8410		13,67,		\$50,000.00	
			Cylinders w/ control panel						
		and appurtenances		—— [· · · ·					
		sch. 80 carbon steel	pipe, valves & fittings						
		Fire Suppression Sy		D-8410	1	L.S.		\$50,000.00	
		3 Fire hose reels w/			<u> </u>	L.J.		330,000.00	
			hold 20# extinguishers	-					
			Carbon steel pipe, valves & fittings	1					
			-case, 500 gpm @ 300 ft of head						
		1 - The panily, spine	ease, 500 gpm & 500 ft of head						
		Unit Cooling Water	System	D-8410	1	L.S.		\$130,000.00	
	- ' -		umps, end-suction type, 150 gpm		····· 1	12.151		01,70,000,000	
			e, self-cleaning strainers		<u></u>				
		 	copper tubing, valves & fittings		· · · · · · · · · · · · · · · · · · ·				
			iron, mechanical joint pipe & fittings	<u> </u>					
		1,000 105: 07 (1200)	, man, meetameet je meeta je pe ee timings	1					
	18	Lubricating Oil Sys	tem:	D-8410	J	L.S.		\$20,000.00	
	- 	2- 500 gal carbon st						,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
		1 - 10 gpm @ 100 p						•	
		1 - lube oil filter	<u> </u>						
	1		carbon steel pipe, valves & fittings	· · · · ·					
ļ		.,	Sheet Subtotal					\$2,343,000.00	
	QUANTITIES				PI	RICES			
BY	R Christe	nsen, B Sund	СНЕСКЕО	BY D). Donaldson		CHECKED		
	C Berte,		AM		NCA.	i		N 8/17/04	
DATEP	REPARED		PEER REVIEW	DATE PREP.	ARED		PEER REVIEW	-	
5/3/200					08/17/04		4		
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FEATURE:			PROJECT:						
		Powerplant, Bypas veyance System	ss, and Switchyard		Yakima Rive	r Basin Wa	iter Storage Op	otions	
		Design Flow - Q=1		REGION	PN	PRICE I	LEVEL:	Appraisal	
Mechan			FILE: C:\Documents and Scttings\bvanotte\Desktop\Black Rock' Revisions\\BR_Roza PP_1500 Rev 1.xls\Summary					: Rock\Black Rock	
PLANT	PAY ITEM		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT	
OV L	Ϋ́								
				_					
						ļ		-	
	19	Compressed Air System	n:	D-8410	<u> </u>	L.S.		\$50,000.0	
[2 - 100 cfm @ 125 psi	rotary screw air compressors						
		1 - 250 gal, carbon stee	el air receiver						
Ĺ		1 - 100 cfm air dryer				<u> </u>			
<u> </u>		500 lbs. of sch. 40 carb	on steel pipe, valves & fittings						
	20	Service Water System:		D-8410	1	L.S.		\$100,000.0	
		1 - Service water pump	o, 75 gpm @ 200 ft. of head						
Ī		1 - Hydropneumatic Ta	ank, 300 gal.						
		750 lbs. of type K copt	per tubing, valves & fittings						
[
	21	Gravity Drainage Syste	em:	D-8410	I	L.S.		\$50,000.0	
		12 - Floor drains, cast i	iron						
]	5,000 lbs. of cast iron h	nuh & spigot, service weight						
		soil pipe							
			·						
	22	Plant Unwatering Syste	em:	D-8410	1	each		\$70,000.0	
		2 - Vertical turbine typ	e sump pump, 500 gpm @ 50 ft hd						
		I - Drainage jet type dr	rainage pump	[
		1,000 lbs. of type K co	pper tube, valves & fittings						
		3,000 lbs. of ductile iro	on, mechanical joint pipe & fittings			_			
		[
	23	Domestic Water and Sa	anitary Waste System:	D-8410	. <u> </u>	each		\$50,000.0	
]	l	2 - Water Closets							
<u>.</u>		I - Urinal							
		2 - Lavatories & access	sories						
	1	1 - Duplex Sewage Eje	ector						
		2,000 lbs. of east iron b	nub & spigot service weight					l	
	[sewer pipe							
L		400 lbs. of type K copp	oer tubing, valves & fittings						
						.		<u> </u>	
	<u></u>								
			Sheet Subtotal					\$320,000.0	
		QU	ANTITIES			PF	RICES		
BY			CHECKED A	BY 1	D. Donaldson		CHECKED	1 41-11	
	J Grass		Ame		NH NX			b/17/04	
DATE PR			PEER REVIEW	DATE PREP			PEER REVIEW		
	5/27/04				08/17/04			•	

FEATURE:			PROJECT:						
Roza C	Canal F	Powerplant, Bypas veyance System	ss, and Switchyard		Yakima River	Basin W	ater Storage Opt	ions	
Powers	olant E	Design Flow - Q=1	,500 cfs	REGION	PN	PRICE	LEVEL:	Appraisal	
Mechani		J		FILE:	CADocuments and Settings\bvanotte\Desktop\Black Rock\Black Revisions\BR_Roza PP_1500 Rev 1.xls Summary				
T IN	MS								
PLANT ACCOUNT	PAY ITEM		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT	
			1 Al- Conditioning	D-8410		L.S.	<u> </u>	\$1,355,400.00	
		Unmanned air cooled p	and Air Conditioning	D-0410				41,555,145.05	
—— ·· -		OA temp 95 degrees F					-		
		OA temp 2.7 degrees 1	·		- - ·		-		
				 					
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				<u> </u>			ļ		
		Plant - Mechanical St						\$77,995,800.00	
QUANTITIES				Pi	RICES				
BY			CHECKED	BY	D. Donaldson		CHECKED	,	
	P Schlein	1	Ane		NA		₿ø√	8/17/04	
DATE PRI	EPARED		PEER REVIEW	DATE PRE	PARED		PEER REVIEW		
6/1/2004					08/17/04		9		

FEATURE:			PROJECT:						
		Powerplant, Bypass, and Switchyard veyance System - Q= 2,500 cfs		Yakima Rive	r Basin '	Water Storage C	ptions		
		Design Flow - Q=1,500 cfs	REGION	PN	PRICE	LEVEL:	Appraisal		
Electric		·	FILE:		ovanotte\Desktop\Blac 00 Rev 1.xls Summar				
۲ <u>۲</u>	EM								
PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
- ¥.	a.			<u> </u>					
	ļ	· · · · · · · · · · · · · · · · · · ·			<u> </u>		·		
		<u> </u>				#1 550 000	¢1 550 000 6		
	<u> </u>	Electrical Generator (F&I)	D8430	<u> </u>	EA	\$1,550,000	\$1,550,000.0		
	-	25,000 kVA, 6,900 volts, 3-phase, 60 Hz		·		 			
		276.9 rpm, 95 % power factor				 			
	ļ	Vertical, synchronous machine				 			
	 	Static excitation system & voltage regulator							
,									
		Plant Grounding System (F&I)	D8430						
	2		D134.30	30	EA	\$180.00	\$5,400.0		
		Stranded bare-copper conductor:			L3/ L	1.00.00	Ψ5,400.		
		250 MCM		1,200	LF	\$5.50	\$6,600.0		
		4/0 AWG		800	LF	\$4.00	\$3,200.0		
	-	2/0 AWG		500	LF	\$3.50	\$1,750.0		
	6	4 1110		800	LF	\$2.50	\$2,000.0		
		4.3.10				1	4-1000		
	ł	Generator Bus & Metal-Enclosed Switchgear (F&I)	D8430						
	7	Generator non-segragated phase bus:		250	LF	\$1,400.00	\$350,000.0		
	- i	15 kV, 3000 amperes, 3-phase, 60 Hz				<u> </u>			
	8	Generator power circuit breaker:		1	EA	\$730,000	\$730,000.0		
		15 kV, 3000 amperes, 3-phase, vacuum type							
						T			
	9	Station-service fused interrupter switch:		1	EA	\$30,000.00	\$30,000.0		
	1	15 kV, 600 ampere, 3-phase, w/ power fuses							
'' '									
	İ								
		Generator Control Equipment (F&I)	D8430						
	10	Duplex control switchboard for operation of the		1	EA	\$730,000	\$730,000.0		
		generator							
	<u> </u>								
					:				
		Sheet Subtotal				l l	\$3,408,950.0		
		QUANTITIES		Λ - Λ · σ	P	RICES			
BY	M. Schul	CHECKED L Rom'	BY A	YCK For		CHECKED	Whole		
n. 4 === =	D8430		- 	Elizabeth Tran			8/17/04		
DATE PE	REPARED	PEER REVIEW	DATE PRE			PEER REVIEW	_		
	5/27/04			08/17/04					
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FEATURE:		PROJECT:					
Roza Outflo	Canal w Con	Powerplant, Bypass, and Switchyard veyance System - Q= 2,500 cfs		Yakima Rive	r Basin 	Water Storage Op	otions
		Design Flow - Q=1,500 cfs	REGION	I PN	PRICE	LEVEL: ^	ppraisal
Electric		_	FILE: CADocuments and Settings\bvanotte\Desktop\Black Revisions\BR_Roza PP_1500 Rev 1.xls\Summar				Rock\Black Rock
⊢ X	1 18						
PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		Plant Battery System (F&I)	 D8430				
	11	125 volt, 300 ampere-hour, lead-acid battery	<u> </u>	1	EA	\$25,000.00	\$25,000.0
	12			2	EA	\$8,000.00	\$16,000.0
	13		<u> </u>	1	EA	\$12,500.00	\$12,500.0
		and molded-case circuit breakers					
		Plant Station-Service Equipment (F&I)	D8430				
		Indoor secondary unit substation with following			<u> </u>	 	
	_	features:					
	14			I	EA	\$55,000.00	\$55,000.0
	. 15	480 volt power-circuit breakers, 600 amperes		5	EA	\$4,000.00	\$20,000.0
				 ·	l		
	-	Building Lighting System (F&I)	D8430				
		Interior luminaires				l	
	<u>1</u> 6	· · · · · · · · · · · · · · · · · · ·		24	EA	\$700.00	\$16,800.0
		480 volt, 1-phase	-			 	*********
	17	· · · · · · · · · · · · · · · · · · ·		36	EA	\$220.00	\$7,920.0
	18	Emergency lighting system		<u> </u>	LS	\$900.00	\$900.0
	_						
		Exterior luminaires				# 100.00	0.000.0
	19			12	EA	\$400.00	\$4,800.0
		70 watt, 120 volt				-	
	20	Building Fire Detection & Alarm System (F&I)	D8430	1	LS	\$150,000	\$150,000.0
		Distribution Panelboards (F&I)	D8430			<u> </u>	<u>-</u>
	21			2	EA	\$30,000.00	\$60,000.0
	_	with 12 molded-case circuit breakers	_			l	
_							
		Mutus Control Conton (F.S.I)	D8430				
	22	Motor Control Center (F&I) 480 volts, 3-phase, 1600 ampere main bus		1	EA	\$195,000	\$195,000.0
	22	Six 20 inch wide sections		,	Lit	4175,000	9173,000.0
		ON 20 HOL WILE SECTIONS				i	·- · ·
		· · · · · · · · · · · · · · · · · · ·				· [
		Sheet Subtotal					\$563,920.0
	QUANTITIES				F	RICES	
BY	M. Schul	CHECKED L Rom.	BY	ACA For		CHECKED	
	D8430	L Kom		Elizabeth Tran		130	8/17/04
DATÉ P	REPARED	PEER REVIEW	DATE PRE	PARED		PEER REVIEW	
	5/27/04			08/17/04		1 9	-

	EATURE:		PROJECT: Yakima River Basin Water Storage Options						
Roza (Canal I	Powerplant, Bypass, and Switchyard veyance System - Q= 2,500 cfs		Yakima Rive	r Basin '	Water Storage O _I	ptions		
		Design Flow - Q=1,500 cfs	REGION	PN PRICE LEVEL: Appraisal					
Electrica		,	FILE:	C:\Documents and Settings\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\					
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PLANT	РАҮ ПЕМ	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
						ļ			
	ļ			<u> </u>					
<u> </u>		Insulated Conductors (F&I)	D8430			 			
<u> </u>		15 kV shielded power cable: 4 AWG		300	FT	\$12.00	\$3,600.00		
····	23	4 A W G				1			
		600-volt single-conductor, stranded-copper:							
	24			6,000	Fľ	\$0.65	\$3,900.00		
	25	I0 AWG		4,000	FT	\$0.80	\$3,200.00		
	26	6 AWG		1,000	FT	\$1.55	\$1,550.00		
	27	4 AWG		1,000	FT	\$1.80	\$1,800.00		
	28	1/0 AWG		600	FT _	\$2.90	\$1,740.00		
ļ	29	4/0 AWG		600	FT	\$5.00	\$3,000.00		
				<u> </u>		l			
	ļ	600-volt multi-conductor control cable:	-		 rze	\$1.75	\$2,625.00		
	30			1,500 2,000	FT FT	\$2.00	\$4,000.00		
	31			2,000	FT	\$1.80	\$3,600.00		
_		5 conductor 10 AWG		2,000			4.5,000.00		
	1								
		Conduit System (F&I)	D8430						
	ļ	Rigid steel conduit:				<u> </u>			
	. 33	1 inch		1,000	FT	\$14.00	\$14,000.00		
	34			500	FT	\$18.00	\$9,000.00		
	35			600	FT	\$22.00	\$13,200.00		
	36	2 1/2 inch		350	FT	\$30.00	\$10,500.00		
-		Plastic-coated rigid steel:							
	37			750	FT	\$30.00	\$22,500.00		
	J	2 1163				1	,		
	<u> </u>								
		·							
	ļ			i					
<u> </u>						-			
ļ		·				 			
<u> </u>	 	Plant - Electrical Subtotal				 	\$4,071,085.00		
		QUANTITIES			Р	RICES	ψΨ,071,000,000		
BY	M. Schu		ВУ	DED for		CHECKED			
	D8430	h CHECKED L Rom'		Elizabeth Tran		Bo.	8/17/041		
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	5/27/04		.	08/17/04		L 4			
5/27/04					0				

FEATL	EATURE:		PROJECT:						
Roza C	Canal	Powerplant, Bypass, and Switchyard veyance System - Q= 2,500 cfs		Yakima Riv	er Basin	Water Storage	Options		
Power	olant [Design Flow - Q=1,500 cfs	REGION	PN_	PRICE LEVEL: Appraisal				
		Transmission Line	FILE:	C:\Documents a Revisions\[BR_]	ments and Settings\bvanotte\Desktop\Black Rock\Black s\[BR_Roza PP_1500 Rev 1.xls\[Summary]				
		The state of the s			1				
PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
			-		 				
		Switchyard	Ī						
				<u> </u>					
	ļ <u>.</u>	Furnish and Install:	D8440	- · · · · · · · · · · · · · · · · · · ·	EA	\$450,000	\$450,000.0		
		Oil-filled power transformer 25 MVA; 34.5-6.9kV, 3-phase	100440		+		1		
	<u> </u>	23 M V A, 34.3-0.9K V, 3-pmase			1				
	2	F&I 34.5-KV PRIMARY UNIT SUBSTATION:	D8440	1	EA	\$375,000	\$375,000.0		
		INCOMING 34.5KV SECTION/BUS/INTERRUPTER			ļ				
		'OUTGOING 6.9KV SECTION/BUS/INTERRUPTER			<u> </u>		<u></u>		
	Ī	'SURGE ARRESTORS, 30KV			<u> </u>				
			 	-	ļ	<u> </u>	<u> </u>		
				<u> </u>	.	<u> </u>			
				·					
	T			ļ. ·	 				
		Tap at existing 34.5-kV line	 	 					
		Furnish and Install:				· · ·			
l						T			
	3	Wood-pole tap structure	D8440	l	EA_	\$9,000.00	\$9,000.0		
	Ī		_	<u></u>		<u> </u>			
				<u> </u>		-			
	<u> </u>								
			 	ļ	 				
						 			
	<u> </u>				 		<u> </u>		
		Construct Transmission Line	D8440	1,000		\$40.00	\$40,000.0		
		Assume 1000 feet of transmission line from		1		1			
		existing 34.5-kV line							
	<u> </u>	wood poles, 1115 AWG conductor			<u>.</u>				
	T			<u></u>					
	<u> </u>								
	<u></u>			,		<u> </u>	·		
						<u> </u>			
				<u> </u>	1	<u> </u>			
				 					
	-	Switchyard & Transmission Line Subtotal				-	\$874,000.00		
	•	QUANTITIES			P	RICES	· · · · · · · · · · · · · · · · · · ·		
BY		CHECKED	BY	Heal for		снескер			
L. Gamucio	ello		/	Elizabeth Tran		B.	OV 8/17/04		
DATE PR	EPAREI	PEER REVIEW	DATE PRE	PARED		PEER REVIEW			
5/27/04	5/27/04 James R. Zeiger		08/17/04			<u> </u>			

Black Rock Outlet Facility and Outflow Conveyance $Q_{\text{(Conveyance)}} = 2,500 \text{ cfs}$ $Q_{\text{(Power Plant)}} = 900 \text{ cfs}$

Field Cost Estimate

	EATURE: Black Rock Assessment Study				PROJECT: Yakima River Basin Water Storage Options						
			ass, and Switchyard		rakiiia Kiv	CI Dasiii v	ratei Storage	Options			
Outflow	v Con	veyance System	- Q= 2,500 cfs	REGION	PN	PRICE	LEVEL:	Appraisal			
Powerp Summar		Design Flow - Q=	= 900 cfs	FILE:	C:\Documents :	and Settings\b	vanotte\Desktop\ _i Rev Lxls Sum	Black Rock\Black Rock			
					RCVISIONS (DR.	Juniyakert					
PLANT ACCOUNT	PAY ITEM		DESCRIPTION	CODE	QUANTITY	UNIT	UNITPRICE	AMOUNT			
						<u> </u>					
			yance System sized for 2,500 cfs.			.					
		Roza Canal Powerpl	ant sized for 900 cfs.								
		Assumes Roza 8	South Q goes through Powerplant.			_					
		Sunnyside Deliv	eries by Pressure Pipe Option.								
		Roza North Deli	veries by Pressure Pipe Option.								
		Black Rock Outflow	Conveyance Subtotal					\$306,402,600.00			
		Plant - Civil and Stru	ctural Subtotal	.		 		\$19,925,100.00			
		Plant - Mechanical S	ubtotal					\$77,295,800.00			
		Plant - Electrical Sub	etotal					\$4,071,085.00			
		Societahousel & Teamor	minging Line Cultistal					\$874,000.00			
		Switchyard & Transi	nission Line Subtotal					.9074,000.00			
			-			 					
l		Subtotal						\$408,568,585.00			
		Buntoun			<u>'</u>			\$ +00,500,505.00			
		Mobilization		+/- 5%				\$20,000,000.00			
		Monazaron		77-13-70		-		\$20,000,000.00			
		Subtotal w/ mobiliza	tion					\$428,568,585.00			
		Subtotal w/ mobiliza	non			+		.,1426,306,363.00			
!		Unlisted Items		+/- 10%		.		941.421.415.00			
		Unusied nems		+1- 10%				\$41,431,415.00			
		CANDIDA CALCAND	,			 					
		CONTRACT COST				. 		\$470,000,000.00			
				1000		-					
		Contingencies		+/- 25%				\$120,000,000.00			
		FIELD COST						\$590,000,000.00			
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	QUANTITIES					<u> </u>	RICES]			
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17 I			CHECKED	1	D. Donaldson	yen-	CHECKED ØØ	v 8/17/4			
DATE DOT	TD4 DESC		DEED HARLEY	_	Elizabeth Tran						
DATE PRE	SEARED		PEER REVIEW	DATE PREI		ľ	PEER REVIEW	1.			
			1		08/17/04		7.	<i>Y</i>			
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FEAT	EATURE:			PROJECT:					
		Powerplant, Bypass, and Switchyard veyance System - Q= 2,500 cfs		Yakima River	Basin W	/ater Storage O	ptions		
		Design Flow - Q= 900 cfs	REGION	PN PRICE LEVEL: Appraisal					
Black Ro	ock Ou	tflow Conveyance	FILE:	C:\Documents and Settings\bvanotte\Desktop\Black Rock\Black Roc Revisions\Priest Rapids PP_3500 Rev Lxls\Summary					
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PLANT ACCOUNT	PAYITEN	DESCRIPTION	CODE	QUANTITY	TINU	UNIT PRICE	AMOUNT		
			<u> </u>						
		Construct Intake Structure with Fishscreens			l				
-		Assume single level intake at Black Rock Reservoir.							
		Assume Top of Dead Pool @ El. 1500.0							
		Assume 100 of Beaution & El. 1500.0							
		Civil/Structural					<u>-</u>		
		Structural Excavation and Backfill							
		Assume top 5 feet of excavation is common and the remaine	Jer is rock	······			,		
	1	Excavation of common materials for structures	D8120	1,700	CY	\$12.00	\$20,400.00		
		Excavation of rock for structures (drill & shoot)	D8120	1,000	CY	\$45.00	\$45,000.00		
		Assume no backfill.							
]				
	ĺ			· - · - ·	<u> </u>				
		Construct Fishscreened Intake Structure (incl. Manifold End	 						
		Furnish, form, and place reinforced concrete (fc=4ksi)	D8120	1,500	CY	\$400.00	\$600,000.00		
•	4	Furnish and place concrete reinforcement. (110#/CY)	D8120	165,000	LBS	\$1.00	\$165,000.00		
		Furnish and handle cement	D8120	423	TONS	\$150.00	\$63,450.00		
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		Sheet Subtotal			Ď.	NOTE:	\$893,850.00		
		QUANTITIES		ħ		RICES			
BY	Dick LaF 6/3/04	ond CHECKED M.R.OShu	ВҰ	D. Donaldson	X.	CHECKED Bov	8/19/04		
DATE PRI	EPARED	PEER REVIEW	DATE PRE	PARED		PEER REVIEW	<u> </u>		
			08/17/04				.		

	FEATURE:			PROJECT: Yakima River Basin Water Storage Options						
Roza (Canal	Powerplant, Bypass, and Switchyard		Yakima River	Basin W	ater Storage O	ptions			
	utflow Conveyance System - Q= 2,500 cfs werplant Design Flow - Q= 900 cfs			PN	PRICE	LEVEL:	Appraisal			
rower	piani	Design Flow - Q= 900 dis	REGION FILE:							
Black R	tock Ou	tflow Conveyance		C:\Documents and Revisions\\Priest R	Settings\bv: apids PP_3.	anotte\Desktop\Bla 500 Rev 1.xls Sum	ck Rock\Black Rock mary			
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNITEPRICE	AMOUNT			
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		Construct Intake Structure with Fishscreens				<u> </u>				
		Mechanical								
	 	Weethameat								
	6	Fish screen, radius = 20 ft, 90 ft long half cylinder shape	D-8410							
	,	structural steel weight		104,000	LBS	\$4.00	\$416,000.0			
		stainless steel weight		70,000	LBS	\$15.00	\$1,050,000.0			
	7	Air burst cleaning system, 250 psi working pressure	D-8410			ļ				
		a. 30,000 gallon receiver tank		60,000	LBS	\$4.00	\$240,000.0			
<u> </u>		b. Air compressor units, each 30 hp, 87 cfm @ 250 psi		1,200	LBS	\$20.00	\$24,000.0			
	-	600 lbs cach, two required 6" dia. piping and butterfly valves (steel)		10,000	LBS	· \$7.00	\$70,000.0			
		le. 6 dia. piping and butterny varves (seeci)			7.00	00.14.	\$70,000.0			
	8	Bulkhead gates and frames/guides (steel)	D-8410	144,000 :	LBS	\$4.00	\$576,000.00			
		(assumes four - 10' by 10' bulkhead gates)		<u></u>						
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		Sheet Subtotal					\$2,376,000.00			
		QUANTITIES				ICES				
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FEAT		D	and Contabused	Yakima River Basin Water Storage Options						
		Powerplant, Bypa veyance System	ass, and Switchyard		Yakıma River	Basin v	vater Storage C	ptions		
		Design Flow - Q=		REGION	l PN	PRICE LEVEL:		Appraisal		
		tflow Conveyance		FILE:			vanotte\Desktop\Bla 3500 Rev 1.xls Sum	ck Rock\Black Rock		
PLANT	РАУЛЕМ		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
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	ļ <u>.</u>			<u> </u>		<u> </u>				
		G			<u> </u>	-				
		Construct Surge Sha	<u></u>			 -				
							 			
		Construct 530-ft deep	, 40.0-ft finished diameter, 46-ft excava	ted diameter,	shaft in rock.					
			d by raise bore and slash method (drill d		L					
		Water problems will t	be minimal. Shaft has two final support	reaches.						
	ļ <u></u>									
		· · · · · · · · · · · · · · · · · · ·	ced concrete lined reach							
	24	·· · · · · · · · · · · · · · · · · ·		D-8140	430	lf .	\$17,000.00	\$7,310,000.00		
		(26,500 cy, appro	*	D 9140	£ 450	· · · · · · · · · · · · · · · · · · ·	\$400.00	\$2,580,000.00		
	25	Furnish and place	unreinforced concrete shaft lining	D-8140	6,450	су	\$400.00	\$2,380,000.00		
	26	Cementitious mat	terials for concrete shaft lining	D-8140	1,820	tons	\$130.00	\$236,600.00		
	27	Furnish & install	1-in dia, 12-ft long rock bolts	D-8140	21,000	lin ft	\$60.00	\$1,260,000.00		
		ł	concrete lined shaft top reach			ļ				
	28	ļ		D-8140	100	lf ———	\$17,000.00	\$1,700,000.00		
		(6,160 cy, approx		D-8140	1 500		\$400.00	\$600,000,00		
	29	Furnish and prace	e reinforced concrete shaft lining	D-8140	1,500	су		\$600,000.00		
	30	Cementitious mat	terials for concrete shaft lining	D-8140	423	tons	\$150.00	\$63,450.00		
	31	Furnish and insta	ll concrete reinforcement	D-8140	18,700	lin ft	\$1.00	\$18,700.00		
· · · · · · · · · · · · · · · · · · ·										
	32	Furnish & install	1-in dia, 12-ft long rock bolts	D-8140	4,800	lin ft	\$60.00	\$288,000.00		
	<u> </u>									
								<u> </u>		
	33	Furnish and install cha	nin link protection	D-8140	76,600	sq yd	\$20.00	\$1,532,000.00		
							Ψ20.00	\$1,552,000.00		
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		D. I. B. N. O. 45	6 51141				<u></u>	***************************************		
	<u> </u>	1	Conveyance Subtotal JANTITIES	<u> </u>		DE	RICES	\$306,402,600.00		
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.,,	Bill Thor	npson	CHARED KA	le i	D. Donaldson		CHECKED B	N 8/17/04		
DATE PR		-	PEER REVIEW	DATE PRE	PARED		PEER REVIEW/			
	DATE PREPARED 4/19/04 PEER REVIEW			08/17/04				2		
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FEATURE: Roza Canal Powerplant, Bypass, and Switchyard			PROJECT: Yakima River Basin Water Storage Options						
		veyance System - Q= 2,500 cfs		Yakima Kive	r basın	water Storage	Options		
		Design Flow - Q= 900 cfs	REGION	PN	PRICE	LEVEL:	Appraisal		
Civil/Sit	e			C:\Documents and Settings\bvanotte\Desktop\Black Rock\Black R Revisions\Priest Rapids PP_3500 Rev 1.xls]Summary					
PLANT	PAY ITEM	DESCRIPTION	СОДЕ	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
		Access Road (60 ft of 24ft wide bituminous surface):							
			7000		0.5				
		Clear roadway alignment	D8120	1,440	SF	\$1.00	\$1,440.0		
		Furnish and place base course material (9-inch depth)	D8120	75	TONS	\$20.00	\$1,500.0		
	3	Furnish and place asphalt concrete (6-inch depth)	D8120	55	TONS	\$100.00	\$5,500.0		
Service Yard (6" asphalt concrete surface)									
		Assume T.O Yard= El 1176.0							
	4	Strip and clear pumping plant site to 1 foot depth	D8120	7,850	CY	\$5.00	\$39,250.00		
	5	Common excavation to Yard (25% Strip & Clear)	D8120	2,000	CY	\$7.00	\$14,000.00		
6 Place and compact embankment for yard (25% Exc.)			D8120	500	CY	\$12.00	\$6,000.00		
		Furnish and place base course material (6-inch)	D8120	4,600	TONS	\$20.00	\$92,000.00		
	8	Furnish and place asphalt concrete (6-inch)	D8120	5,100	TONS	\$100.00	\$510,000.00		
		Furnish and install 7-foot chain link fence for PP Yard	D8120	1,900	LF	\$20.00	\$38,000.00		
	10 Furnish and install 7-foot x 24-foot access gates		D8120	3	EA	\$3,500.00	\$10,500.00		
i									
		Diversion During Construction:							
	ļ	Assume need to pass 900 cfs canal flow during							
		construction. Assume local borrow.							
		Assume no dewwatering required.							
	 	Construct U/S & D/S earth cofferdams. (Height=15 ft)	D8120	2,000	CY	\$15.00	\$30,000.00		
		F&I impervious geomembrane on cofferdams.	D8120	350	SY	\$15.00	\$5,250.00		
	13	F&I three 9-ft dia. X .138-in galv., corrugated metal pipes	D8120	1,000	LF.	\$500.00	\$500,000.00		
		btwn cofferdams. Wt/Ft= 210 lbs/ft.	.} -						
	14	Remove cofferdams and diversion structures	D8120		LS	\$20,000.00	\$20,000.00		
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		Sheet Subtotal					\$1,273,440.00		
		QUANTITIES				RICES			
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	ATE PREPARED PEER REVIEW 6/3/04		08/17/04				2		
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FEAT	_			PRUJE					
			Bypass, and Switchyard		Yakima Rive	er Basin	Water Storage	Options	
		veyance Sys Design Flow	tem - Q= 2,500 cfs	REGION	PN	PRICK	LEVEL:	Appraisal	
I OWEI	piant L	Jesigii i low	- Q= 300 cl3	EII E.					
Civil/Sit	е						bvanotte\Desktop\B1. _3500 Rev 1.xls Sun	ack Rock\Black Rock imary	
PLANT ACCOUNT	PAY ITEM		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT	
		<u> </u>		1					
	· ·		····						
		Tailrace Cham	nel (Lined - Lining covered under structural)						
		T.O Ground	d El. 1176. Assume T.O. Rock El. 1150			I			
		Assume sto	ekpile rock and common material for reuse.						
	15	Common excava	ation for tailrace channel	D8120	39,000	CY	\$5.00	\$195,000.00	
	16	Rock excavation	n for tailrace channel (drill & shoot)	D8120	17,500	CY	\$32.00	\$560,000.00	
	1	Ī						[
		Structural Exe	avation and Backfill	[" "[
		T.O Ground	d El. 1176. Assume T.O. Rock El. 1150						
		Assume sto	ekpile rock for later use as riprap.			· · · · ·			
	17	Common excava	ation for structures	D8120	23,700	CY	\$12.00	\$284,400.00	
	18	Rock excavation	n for structures (drill & shoot)	D8120	16,700	CY	\$32.00	\$534,400.00	
	19	Furnish backfill	for structures (reuse excavation)	D8120	5,800	CY	\$6.00	\$34,800.00	
	20	Place backfill ar	ound structures	D8120	5,800	CY	Included above		
	21	Compact backfi	ll around structures	D8120	5,800	CY	\$8.00	\$46,400.00	
		,		T					
	Ī	Pipe Trench Ex	scavation and Backfill			·			
	·		xeavation in yard.					··	
			El. 1176. Assume T.O. Rock El. 1150						
	22		ation for pipe in Service Yard	D8120	18,000	CY	\$10.00	\$180,000.00	
			& compact backfill for pipe (local)	D8120	11,500	CY	\$6.00	\$69,000.00	
			, , , , , , , , , , , , , , , , , , ,		,		,,,,,,		
	ļ		cavation and Backfill						
		 	el Portal (Sta. 910+00) to Yard (Sta. 940+00)						
		į	common excavation	1					
		Common excava		D8140	487,000	CY	\$5.00	\$2,435,000.00	
		Furnish backfill		D8140	461,500	CY	Included above		
	1	Place backfill an	N-1-1	D8140	461,500	CY	\$3.00	\$1,384,500.00	
	28	Compact pipe ba	ackfill (F&P included in above items)	D8140	36,000	CY	\$3.00	\$108,000.00	
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			Sh. 46 based						
			Sheet Subtotal	<u> </u>		В	DICES.	\$5,831,500.00	
			QUANTITIES				RICES		
BY		ond (D8120)	CHECKED Unas Favol (D8140)	ву г).Donaldson 🆊	KD-	CHECKED	« ha /n/	
		wles (D8140)	M. R. O Shen (0-8120)	<u> </u>				8/17/04	
DATE PR			PEER REVIEW	DATE PREPARED PEER REVIEW			`		
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FEAT		Davis and Division and Control or and	PROJECT: Yakima River Basin Water Storage Options						
		Powerplant, Bypass, and Switchyard veyance System - Q= 2,500 cfs		Yakima Riv	er Basin \	Water Storage (Options		
		Design Flow - Q= 900 cfs	REGION	l PN	PRICE LEVEL: Appraisal				
Structur	al and	Architectural	FILE:		ts and Settings\bvanotte\Desktop\Black Rocl riest Rapids PP_3500 Rev 1.xls\Summary				
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ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
		COUNTY ON AN							
		STRUCTURAL					· · · .		
	[Construct Concrete Tailrace Lining and Retaining Walls							
		Assume lining is 1-foot thick w/ #6@12" EW EF, 1.5:1 sid	e slopes	1.					
	29	Furnish, form, and place reinforced concrete lining	D8120	2,000	CY	\$400.00	\$800,000.00		
	Ī	in excavated channel (f'c= 4 ksi)							
	30	Furnish, form, and place reinforced concrete walls	D8120	1,500	CY	\$400.00	\$600,000.00		
	31	Furnish and place concrete reinforcement.	D8120	455,000	LBS	\$0.80	\$364,000.00		
		Assume 130 #/CY			<u> </u>				
	32	Furnish and handle cement (.282T/CY)	D8120	980	TONS	\$140.00	\$137,200.00		
		Construct Powerplant and Bypass Substructure							
	33	Furnish, form, and place reinforced concrete	D8120	14,500	CY	\$350.00	\$5,075,000.00		
		Furnish and place concrete reinforcement.	D8120	1,740,000	LBS	\$0.65	\$1,131,000.00		
		Assume 120 #/CY	D0120_	1,740,000		30.0,7	\$1,151.000.00		
	35	Furnish and handle cement (.282T/CY)	D8120	4,090	TONS	\$120.00	\$490,800.00		
				.,,,,,,		V120.00	# 120,000.00		
	36	Construct Powerplant and Bypass Superstructure	D8120	15,620	SF	\$100.00	\$1,562,000.00		
		212.5-ft x 73.5-ft x 42-ft high superstructure							
		Structural steel superstructure with CMU walls.	_						
	ļ	Stepped columns for 90T crane support							
		Built-up roof on metal roof deck.							
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		Sheet Subtotal					\$10,160,000.00		
		QUANTITIES			PF	RICES			
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DATE PRI	PARED	PEER REVIEW	DATE PRE	PARED		PEER REVIEW	1		
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FEAT	ATURE: za Canal Powerplant, Bypass, and Switchyard		PROJECT:						
		Powerplant, Bypass, and Switchyard veyance System - Q= 2,500 cfs		Yakima Rivo	er Basin '	Water Storage	Options		
		Design Flow - Q= 900 cfs	REGION	PN	PRICE	LEVEL:	Appraisal		
Structura	al and /	Architectural	FILE:			bvanotte\Desktop\Black Rock\Black Rock _3500 Rev 1.xls Summary			
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PLANT	РАҮ ИЕМ	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
		STRUCTURAL (cont.)							
		Construct Pipe Encasements in Yard							
		Furnish, form, and place reinforced concrete	D8120	3,100	CY	\$400.00	\$1,240,000.00		
	38	Furnish and place concrete reinforcement.	D8120	341,000	LBS	\$0.80	\$272,800.00		
		Assume 110 #/CY							
	39	Furnish and handle cement (.282T/CY)	D8120	874	TONS	\$140.00	\$122,360.00		
	ļ — —						- ·		
		Structural Steel							
	40	Furnish and install structural steel (painted):	D8120	175,000	LBS	\$4.00	\$700,000.00		
		Includes crane girder, rail, and hoist frames.							
		Does not include typ. building framework.							
		Miscellaneous Metalwork							
	41	Furnish and install miscellaneous metalwork	D8120	45,000	LBS	\$7.00	\$315,000.00		
		Includes grating, hatches, ladders, guardrail, and							
		cable trays							
		Motor populated extension insulated well up door	DRIGO		E A		#10 000 00		
	. 42	Motor-operated, exterior insulated roll-up door	D8120	· · · · · · · · · · · · · · · · · · ·	EA	\$10,000.00	\$10,000.00		
		18' x 20'							
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	Plant - Civil and Structural Subtotal						\$19,925,100.00		
***		QUANTITIES		<u>-</u>	PI	RICES			
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DATE PRE	PARED	PEER REVIEW	DATE PREF	ARED		PEER REVIEW			
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FEATURE:				PROJECT:							
			pass, and Switchyard		Yakima River	Basin Wa	ater Storage Op	tions			
Outfloy	v Con	veyance System	n - Q= 2,500 cfs	BECION	DNI	DDIZE:	. 123/121 .	A			
Power	piant i	Design Flow - Q	= 900 crs	REGION	PN	PRICE	LEVEL:	Appraisal			
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PLANT ACCOUNT	PAY ITEM		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT			
		Major Mechanical	Equipment								
	<u> </u>	Turbine-Vertical Fra		D8420	125,000	LBS	\$20.00	\$2,500,000.00			
	l	400 rpm, 339 ft. De:									
		CF3 18-8 Stainless 1	Runner 3.3 cta.								
						 					
	2	Digital Governor, 10	33 905 ft -lbs	D8420		EA	\$275,000.00	\$275,000.00			
		150 psi system									
	3	Governor Pressure T	Tank 875 Gal.	D8420	7,640	LBS	\$10.00	\$76,400.00			
		Look to Flaming Go	orge Oil Tank								
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			Sheet Subtotal			···		\$2,851,400.00			
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			John Brooks		N	v -	BOV	8/17/04			
DATE PREPARED PEER REVIEW		PEER REVIEW	DATE PREPA	ARED]	PEER REVIEW	~				
4/14/04											

Roza	FEATURE: Roza Canal Powerplant, Bypass, and Switchyard Dutflow Conveyance System - Q= 2,500 cfs Powerplant Design Flow - Q= 900 cfs				PROJECT: Yakima River Basin Water Storage Options						
					PN	PRICE	LEVEL:	Appraisal			
Mechar				FILE:		d Settings\bvanotte\Desktop\Black Rock\Black Ro Rapids PP_3500 Rev 1.xls Summary					
PLANT ACCOUNT	PAY ITEM		DESCRIPTION	СОДЕ	QUANTITY	UNIT	UNIT PRICE	AMOUNT			
		Furnish and insta	Il the following:								
		Steel Penstock:									
		Steel plate used fo ASTM A36: § (All pipe sizes are	Sy = 36 kpsi inside diameters)	-							
	4 204" Dia., I 15/16" wall, L= 4,993 it., 4265 lbs/ft		wall, L= 4,993 it., 4265 lbs/ft	D8420	21,300,000	LBS	\$2.00	\$42,600,000.0			
	5	84" Dia., 13/16" w	all, L= 492 ft., 737 lbs/ft	D8420	363,000	LBS	\$2.00	\$726,000.0			
		! 	ling Basin for Sleeve Valves:								
· · · 	ASTM 316L Stainless steel plate 6 Four - 396" Dia., 1 1/4" wall cylindrical tanks with baseplates:		I/4" wall cylindrical tanks with baseplates:								
		Each tank heig Total weight fo	tht = 20 feet or four tanks = 1,180,000 lbs.	D8420	1,180,000	LBS	\$15.00	\$17,700,000.0			
		Sleeve valves with	hydraulic operators:	-							
	7	ASTM 316L	et X 72" Dia. Outlet Valves Stainless steel plate eight = 70,000	D8420	280,000	LBS	\$15.00	\$4,200,000.00			
			for four valves = 280,000 lbs.								
		 	ith hydraulic operators:	D0400	240.000	1.00	410.00	42 400 000 0			
	8 Sleeve valve guard valves Four - 60" Dia. Spherical valves with hydraulic operators 60,000 lbs. per valve		erical valves with hydraulic operators	D8420	240,000	LBS	\$10.00 	\$2,400,000.00			
	Turbine guard valve 9 One - 84" Dia. Spherical valve with hydraulic operator		crical valve with hydraulic operator	D8420	140,000	LBS	\$10.00	\$1,400,000.00			
		140,000 lbs. pe Sunnyside Power	Plant Isolation Valve					· ···-			
	10		erical valve with hydraulic operator	D8420	140,000	LBS	\$10.00	\$1,400,000.00			
Sheet Subtotal			_		DIOCE	\$70,426,000.00					
ВҮ	Nathan N	iakamoto, D8420	CHECKED Rick Frisz, D8420	BY	D. Donaldson De		CHECKED BOX	8/17/04			
DATE PREPARED 5/26/04		DATE PREPARED 08/17/04 PEER REVIEW 08/17/04									
			-	-1				· · · · · · · · · · · · · · · · · · ·			

	Canal	Powerplant, Bypass, and Switchyard veyance System - Q= 2,500 cfs	PROJE		Basin Wa	nter Storage Opt	ions
•	owerplant Design Flow - Q≔ 900 cfs			PN	PRICE	LEVEL:	Appraisal
Mecha				C:\Documents and	nd Settings\bvanotte\Desktop\Black Rock\Black Roc Rapids PP_3500 Rev 1.xls\Summary		
PLANT	РАУПЕМ	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	10	Furnishing and installing one 90-Ton overhead crane, 67.5' span	D-8410	157,500	LBS	\$6.00	\$945,000.0
		Furnishing and installing Hydraulic elevator capacity = 3500 pounds, travel = 31 ft. landings = 3, speed = 100 ft/min.	D-8410	1	unit	S400,000.00	\$400,000.0
	12	Bulkhead gates and guides at turbine (steel) (assumes 3 bays of guides and 3 bulkhead gates)	D-8410	31,000	LBS	\$4.00	\$124,000.00
	13	Monorail hoist for bulkhead gate, electric wire rope, motorized trolley, 5-ton capacity	D-8410	1,500	LBS	\$20.00	\$30,000.0
		Stoplogs, lifting beam & guides at sleeve valves eight bays fo guides, 2 hays of stoplogs (steel)	D-8410	152,000	LBS	\$4.00	\$608,000.00
	15	CO2 High Pressure Fire Extinguishing System: 12 - 100# Storage Cylinders w/ control panel and appurtenances and 400 lbs. of sch. 80 carbon steel pipe, valves & fittings	D-8410	1	L.S.		\$36,000.00
	16	Fire Suppression System: 3 Fire hose reels w/ 100 feet of hose 12 - Portable hand-held 20# extinguishers 2,000 lbs. of sch. 40 carbon steel pipe, valves & fittings	D-8410	I	L.S.		\$50,000.00
	17	1 - Fire pump, split-case, 500 gpm @ 300 ft of head Unit Cooling Water System: 2 - Cooling water pumps, end-suction type, 150 gpm 2 - 8-inch automatic, self-cleaning strainers 1,000 lbs. of type K copper tubing, valves & fittings	D-8410	l	L.S.		\$130,000.00
	18	4,000 lbs. of ductile iron, mechanical joint pipe & fittings Lubricating Oil System: 2-500 gal carbon steel storage tanks 1-10 gpm @ 100 psi oil pump	D-8410	l	L.S.		\$20,000.00
 :		1 - lube oil filter 1,000 lbs. of sch. 40 carbon steel pipe, valves & fittings Sheet Subtotal QUANTITIES			PR	ICES	\$2,343,000.00
BY	C Berte,	nsen, B Sund CHECKED Gruss AM2			cd c	THECKED βου	1 8/17/04
DATE PREPARED PEER REVIEW 5/3/2004		DATE PREPARED 08/17/04 PEER REVIEW					

FEAT	JRE:			PROJE	PROJECT:						
	ta Canal Powerplant, Bypass, and Switchyard flow Conveyance System - Q= 2,500 cfs verplant Design Flow - Q= 900 cfs				Yakima Rive	r Basin Wa	ater Storage Opt	tions			
		-		REGION	l PN	PRICE I	LEVEL:	Appraisal			
Mechan	ical			FILE:			notte\Desktop\Black 100 Rev 1.xls Summar				
NI ENT	TEM					T					
PLANT	PAY ITEM		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT			
				- 							
						 					
	19	Compressed Air Syste	em:	D-8410	1	L.S.		\$50,000.0			
		2 - 100 cfm @ 125 ps	si rotary screw air compressors								
		1 - 250 gal, carbon ste	el air receiver								
		I - 100 cfm air dryer									
		500 lbs. of sch. 40 carl	bon steel pipe, valves & fittings								
	20	Service Water System		D-8410	1	L.S.		0.000,001			
		1 - Service water pum	p, 75 gpm @ 200 ft. of head								
		I - Hydropneumatic T	ank, 300 gal.								
		1	per tubing, valves & fittings								
					_						
	21	Gravity Drainage Syst		D-8410	l	L.S.		\$50,000.00			
		12 - Floor drains, east					<u> </u>				
		1	hub & spigot, service weight			1	<u> </u>				
	ļ	soil pipe					<u> </u>				
ļ								<u> </u>			
	22	Plant Unwatering Syst		D-8410	1	each		\$70,000.00			
	<u> </u>	T	pe sump pump, 500 gpm @ 50 ft hd		ļ	1					
		1 - Drainage jet type d				1					
			opper tube, valves & fittings								
		[3,000 lbs. or ductile in	on, mechanical joint pipe & fittings	+		-		<u></u>			
	23	Domestic Water and S	anitary Waste System:	D-8410	1	each		\$50,000.00			
		2 - Water Closets	•			1 1					
	ļ	I - Urinal]		1 1					
		2 - Lavatories & acces	sories			1					
	ļ	1 - Duplex Sewage Ejo	ector			1[
			hub & spigot service weight			1					
		sewer pipe									
		400 lbs. of type K copp	per tubing, valves & fittings								
						[<u>.</u>					
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		<u></u>	63 45 14 4 1			<u> </u>					
		OI.	Sheet Subtotal JANTITIES			<u></u>	RICES	\$320,000.00			
ву			СНЕСКЕВ	DV.	D. Daniel Jane 1		CHECKED				
	J Grass		Aur	BY	D. Donaldson		HECKED BOV	8/17/04			
DATE PRI	EPARED		PEER REVIEW	DATE PREF	PARED	- 1,	PEER REVIEW				
	DATE PREPARED PE 5/27/04				08/17/04		PEER REVIEW				

FEATURE:				PROJE	PROJECT:					
		Powerplant, Bypa reyance System	ass, and Switchyard - Q= 2,500 cfs	Yakima River Basin Water Storage Options						
		esign Flow - Q=		REGION	l PN	PRICE	LEVEL:	Appraisal		
Mechani		_		FILE:	C:\Documents on Revisions\ Priest	d Settings\bva Rapids PP_35	 motte\Desktop\Black I 500 Rev 1.xls}Summar	tteWesktop\Black Rock\Black Rock Rev 1.xls Summary		
_E 5	EM									
PLANT ACCOUNT	PAY ITEM		DESCRIPTION	CODB	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
				D 9410		1.6		£1.255.400.00		
		Heating, ventuating Unmanned air cooled	, and Air Conditioning	D-8410		L.S.		\$1,355,400.00		
		OA temp 95 degrees i				-				
		Ort tomp 35 degrees					<u> </u>			
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		<u></u>								
		Plant - Mechanical S	uhtotal			┼		\$77,295,800.00		
	ŧ		JANTITIES			PE	RICES	φ77,423,000.00		
BY			СНЕСКЕР	pν	D. Dovoldo //		CHECKED	· · · · · ·		
	P Schlein		ANZ	BY	D. Donaldson	ea [8/17/04		
DATE PRE			PEER REVIEW	DATE PRE	DADED		PEER REVIEW	-, -		
6/1/2004			LEK KUTIU	DATERKE	08/17/04	i	. DOK MEATERS			
			·		00/1/04					

	Canal	Powerplant, Bypass, and Switchyard veyance System - Q= 2,500 cfs	PROJE		er Basin	Water Storage	Options
		Design Flow - Q= 900 cfs	REGION	l PN	PRICE	LEVEL:	Appraisal
Electric	•		FILE:	C:\Documents ar	nd Settings\		ack Rock\Black Rock nmary
PLANT ACCOUNT	PAYITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	1 1	Electrical Generator (F&I)	D8430		EA	\$1,550,000	\$1,550,000.0
		25,000 kVA, 6,900 volts, 3-phase, 60 Hz				-	
		276.9 rpm, 95 % power factor					
	-	Vertical, synchronous machine		"		i	
	1	Static excitation system & voltage regulator					
							-
		Plant Curry ding System (F.C.1)	D8430		 	. .	
	·	Plant Grounding System (F&I)	108430		17.4	4100.00	#5 400 C
		Ground rods, 10 ft, 3/4" dia, copper-clad Stranded bare-copper conductor:		30	EA	\$180.00	\$5,400.0
] 3			1,200	LF	\$5.50	\$6,600.0
	1	 		800	LF	\$4.00	\$3,200.0
	5		·	500	LF	\$3.50	\$1,750.0
	6	4 AWG		800	LF	\$2.50	\$2,000.0
						74.00	φ2,000,τ
		Generator Bus & Metal-Enclosed Switchgear (F&I)	D8430				
	7	Generator non-segragated phase bus:	100430	250	LF	\$1,400.00	\$350,000.0
	 	15 kV, 3000 amperes, 3-phase, 60 Hz		200		\$1,700.00	4550,000.0
	l						
	8	Generator power circuit breaker:		I	EA	\$730,000	\$730,000.0
	.	15 kV, 3000 amperes, 3-phase, vacuum type					
	9	Station-service fused interrupter switch:		<u>l</u>	EA	\$30,000.00	\$30,000.0
		15 kV, 600 ampere, 3-phase, w/ power fuses					
	ļ	Generator Control Equipment (F&1)	D8430				<u> </u>
	10	Duplex control switchboard for operation of the		1	EA.	\$730,000	\$730,000.0
		generator					
							
	\vdash						
	<u> </u>	Sheet Subtotal					\$3,408,950.0
		QUANTITIES		A-1-1-1	Р	RICES	
ВҮ	M. Schul D8430	CHECKED L Rom'	ļ	CAL for Elizabeth Tran		CHECKED Bov	8/17/04
DATE PR	EPARED	*	DATE PREF			PEER REVIEW	
S/27/04		08/17/04 PER KEVILL				<u>/</u>	

FEAT	URE:		PROJE	CT:			
	a Canal Powerplant, Bypass, and Switchyard flow Conveyance System - Q= 2,500 cfs verplant Design Flow - Q= 900 cfs			Yakima Riv	er Basin	Water Storage	Options
			REGION	PN PN	PRICE	LEVEL:	Appraisal
Electric	al		FILE:			ovanotte\Desktop\Bla _3500 Rev 1.xts Sun	nck Rock\Black Rock mary
Έχ	ЕМ]				
PLANT ACCOUNT	PAYITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	<u>-</u>	Plant Battery System (F&I)	D8430				
	11	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		1	EA	\$25,000.00	\$25,000.0
	12			2	EA	\$8,000.00	\$16,000.0
	13			I	EA	\$12,500.00	\$12,500.0
		and molded-case circuit breakers					
	- 	Plant Station-Service Equipment (F&I)	D8430		<u> </u>		
		Indoor secondary unit substation with following]		
		features:					
	14	Dry-type transformer, 6.9 kV-480Y/277, 1500 kVA		I	EA	\$55,000.00	\$55,000.0
	15	480 volt power-circuit breakers, 600 amperes		5	EA	\$4,000.00	\$20,000.0
	_						
		Building Lighting System (F&I)	D8430				
		Interior luminaires					
	16	High bay, high-pressure sodium, 400 Watt		24	EA	\$700.00	\$16,800.0
	.	480 volt, 1-phase					
	17	4 foot fluorescent lighting fixtures, 2 lamps	<u> </u>	36	EA	\$220.00	\$7,920.0
	18	Emergency lighting system		1	LS	\$900.00	\$900.0
	-	Exterior luminaires					·
	19	t		12	EA	\$400.00	\$4,800.0
		70 watt, 120 volt			İ	·	
		Building Fire Detection & Alarm System (F&I)	D8430		LS	\$150,000	\$150,000.0
		Distribution Panelboards (F&I)	D8430				
	21	480-volts, 3-phase, 400 ampere bus, indoor type	'	2	EA	\$30,000.00	\$60,000.0
	<u> </u>	with 12 molded-case circuit breakers]		 -
			<u> </u>				
	1					7.00	
	<u> </u>	Motor Control Center (F&I)	D8430				
	22	480 volts, 3-phase, 1600 ampere main bus		1	EA	\$195,000	\$195,000.0
		Six 20 inch wide sections					
	ļ						
		Sheet Subtotal					\$563,920.00
		QUANTITIES			Pl	RICES	
BY	M. Schul D8430	CHECKED L Romi	вч	DCD for Elizabeth Tran	i	CHECKED	1 8/17/07
DATE PR	EPARED		DATE PREI			PEER REVIEW	
	5/27/04			08/17/04			\mathcal{V}

FEAT	FEATURE:		PROJECT:						
		Powerplant, Bypa veyance System				Yakima Riv	er Basin	Water Storage	Options
		Design Flow - Q=			REGION	PN	PRICE	LEVEL:	Appraisal
Electric	al	-			FILE:		and Settings\bvanotte\Desktop\Black Rock\Black st Rapids PP_3500 Rev 1.xls Summary		
PLANT	PAY ITEM		DESCRIPTION		CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
					 				
		Insulated Conductor	e (F&I)		D8430				<u> </u>
	 	15 kV shielded power			1 20430			 	
	23	4 AWG	cable.			300	FT	\$12.00	\$3,600.0
						500	 	1,112.00	30,000.0
l		600-volt single-condu	etor stranded-core	DAT'	 			·	
	24	12 AWG	etor, stranded-etop	, , , , , , , , , , , , , , , , , , ,		6,000	FT	\$0.65	\$3,900.0
ŀ	25	10 AWG				4,000	FT	\$0.80	\$3,200.0
	26	6 AWG				1,000	Fľ	\$1.55	\$1,550.0
	27	4 AWG				1,000	FT	\$1.80	\$1,330.0
	28	1/0 AWG				600	FT	\$2.90	\$1,740.0
ŀ	29	4/0 AWG			1	600	Fï	\$5.00	\$3,000.0
	29	4/0 A W G				600	FI	33.00	\$3,000.0
		600						1	
l	70	600-volt multi-conduc			-	1.600		ф1 7E	\$2.625.0
ŀ	30	9 conductor 14 A				1,500	FT	\$1.75	\$2,625.0
	31	12 conductor 14 A			+	2,000	FF	\$2.00	\$4,000.0
	32	5 conductor 10 A	wo			2,000	गर	\$1.80	\$3,600.0
		(7) 1 1/4 61 1 1 (7) 6							
		Conduit System (F&	1)		D8430				
		Rigid steel conduit:							
	33	1 inch				1,000	FT	\$14.00	\$14,000.0
	34	1 1/2 inch				500	FT	\$18.00	\$9,000.00
	35	2 inch				600	FI	\$22.00	\$13,200.00
	36	2 1/2 inch				350	FT	\$30.00	\$10,500.00
		In the state of the state of			 				
		Plastic-coated rigid ste	<u>eel:</u>			7.50			
	37	2 inch				750	FT	\$30.00	\$22,500.00
					-	:			
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.		DI 4 EL 41 15 1							
	<u> </u>	Plant - Electrical Sub					-	DIOES.	\$4,071,085.00
		****	ANTITIES				P	RICES	
BY	M. Schuh		CHECKED &	Romi	ВҮ	DCD m		CHECKED A.4.7	61 - 614
	D8430			1 ~077L	<u> </u>	Elizabeth Tran		DVV	8/17/24
DATE PR	EPARED		PEER REVIEW		DATE PREI	PARED		PEER REVIEW	_
	5/27/04					08/17/04			\mathcal{V}

FEAT		Parameters Burners and Cuitaleured	PROJE		.	W 4 C4 O	.1	
		Powerplant, Bypass, and Switchyard veyance System - Q= 2,500 cfs		Yakima Rive	er Basin	Water Storage O	ptions	
Power	plant (Design Flow - Q= 900 cfs	REGION	l PN	PRICE	E LEVEL: A	Appraisal	
Switchy	ard and	Transmission Line	FILE:			igs\bvanotte\Desktop\Black Rock\Black Rock PP_3500 Rev 1.xls Summary		
NT UNT	TEM							
PLANT ACCOUNT	PAY LIEN	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT	
		Switchyard				 		
		Swittiyaru				· · · · · · · · · · · · · · · · · · ·		
		Furnish and Install:				i		
	ı	Oil-filled power transformer	D8440	1	EA	\$450,000	\$450,000.0	
		25 MVA: 34.5-6.9kV, 3-phase						
	2	F&I 34.5-KV PRIMARY UNIT SUBSTATION:	D8440	1	EA	\$375,000	\$375,000.0	
		'INCOMING 34.5KV SECTION/BUS/INTERRUPTER	. <u></u>		-			
		'OUTGOING 6.9KV SECTION/BUS/INTERRUPTER 'SURGE ARRESTORS, 30KV				 		
		SURGE ARRESTORS, 30RV				+		
	†	·	‡ 			···		
						· ·· ·· - 		
	1					1		
		Tap at existing 34.5-kV line						
		Furnish and Install:				<u> </u>		
		Word all to the state of	D0440		F. A	50,000,00		
	3	Wood-pole tap structure	D8440	1	EA	\$9,000.00	\$9,000.00	
		··· · · · · · · · · · · · · · · · · ·						
						 		
						† i		
							-	
· · · · · · · · · · · · · · · · · · ·								
	4	Construct Transmission Line	D8440	1,000	FT	\$40.00	\$40,000.00	
		Assume 1000 feet of transmission line from					 ··	
		existing 34.5-kV line			 			
		wood poles, 1115 AWG conductor	· {			 		
						 		
						1		
								
						ļ <u></u>		
		Switchyard & Transmission Line Subtotal					\$874,000.00	
DV		QUANTITIES		1 6 6		RICES		
BY L. Gamucie	ilo	СНЕСКЕВ	BY	NCD for		CHECKED (Se)	18/17/04	
DATE PRE		PEER REVIEW		Elizabeth Tran		i		
5/27/04	Ja Iarrell	James R. Zeiger	DATE PREP	O8/17/04		PEER REVIEW	1/	
		values to Lorgor		00/1//04			V	

Sunnyside Powerplant, Bypass, and Switchyard

 $Q_{(Bypass)}$ = 1,250 cfs $Q_{(Power Plant)}$ = 900 cfs

Field Cost Estimate

FEATURE: Black Rock Assessment Study Sunnyside Canal Powerplant, Byapss, and Switchyard		IPR(PROJECT: Yakima River Basin Water Storage Options						
Sunnys	ide Car	nal Powerplant, Byap	ss, and Switchyard	REC	GION	N PN	PRICE	LEVEL:	Appraisal
Summai	ıry			FILI	E:			vanotte\Desktop\B _1 Rev 1.xls Sumn	llack Rock\Black Rock mary
PLANT	РАУ ІТЕМ		DESCRIPTION	cc	ODE	QUANTITY	TINU	UNIT PRICE	AMOUNT
							<u> </u>		
						 			+
	ļ. ···	Sitework Subtotal							\$2,320,815.00
	ļ	Structural & Architect	tural Subtotal						\$5,365,170.00
		Mechanical Subtotal					<u> </u>		\$19,621,400.00
		Electrical Subtotal							\$3,761,065.00
	<u> </u>								
		Switchyard & Transm	iission Line Subtotal				-		\$1,234,000.00
						-		<u>-</u> -	
							<u> </u>		
	ļ <u> </u>								
					-				<u> </u>
	ļ								
		Subtotal				ļ			\$32,302,450.00
		Mobilization		+/- 5%		·			
	 			+1- 3 10					\$1,600,000.00
		Subtotal w/ mobilizati	on			-	\vdash		\$33,902,450.00
		Unlisted Items		+/- 10%					\$3,097,550.00
		CONTRACT COST							\$37,000,000.00
		Contingencies		+/- 25%	,				\$10,000,000.00
		FIELD COST				<u> </u>			\$47,000,000.00
						<u> </u>			
<u> </u>							\vdash		
		Ql	JANTITIES				PF	RICES	<u></u>
BY			CHECKED	ВУ		Craig A. Grush Elizabeth Tran		CHECKED <i>BO</i>	m/ 8/17/04
DATE PREPARED PEER REVIEW		DATE	DATE PREPARED O8/17/04 DATE PREPARED O8/17/04 PEER REVIEW DCA 8/17/04				OCA 8/17/04		

FEATURE:		PROJECT:						
Black F	Rock A	Assessment Study		Yakima Rive	r Basin	Water Storage	Options	
Sunnvsi	de Can	al Powerplant, Byapss, and Switchyard	REGION	PN	PRICE	LEVEL:	Appraisal	
Dunnye.	do Car	ari ottorpiani, bysposi and ottrieriyare	FILE.					
Civil/Site	9				_	bvanotte\Desktop\B1 P_1 Rev 1.xls Summ	ack Rock\Black Rock ary	
ᅜ	Na EN							
PLANT ACCOUNT	РАУ (ТЕМ	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT	
F AC	4							
			ļ					
		Access Road (60 ft of 24ft wide bituminous surface):	ļ l		ļ			
			<u> </u>			4.00		
	l	Clear roadway alignment	D8120	1,440	SF	\$1.00	\$1,440.0	
		Furnish and place base course material (9-inch depth)	D8120	75	TONS	\$20.00	\$1,500.00	
	3	Furnish and place asphalt concrete (6-inch depth)	D8120	55	TONS	\$100.00	\$5,500.00	
			-					
		Commiss Vand (Classification and annuface)	·l·					
		Service Yard (6" asphalt concrete surface)	1				-	
		Assume T.O Ground= T.O Yard= El 894.5	D0130	7.000	CV	#5.00	#10 500 O	
		Strip and clear pumping plant site to 1 foot depth	D8120	3,900	CY	\$5.00	\$19,500.00	
		Common excavation to Yard (±50% Strip & Clear)	D8120	2,000	CY	\$7.00	\$14,000.00	
		Place and compact embankment for yard (50% Exc.)	D8120	1,000	CY	\$12.00	\$12,000.00	
		Furnish and place base course material (6-inch)	D8120	3,600	TONS	\$20.00	\$72,000.00	
	 -	Furnish and place asphalt concrete (6-inch)	D8120	4,000	TONS	\$100.00	\$400,000.00	
		Furnish and install 7-foot chain link fence for PP Yard	D8120	1,400	LF	\$20.00	\$28,000.00	
	10	Furnish and install 7-foot x 24-foot access gates	D8120	3	EA	\$3,500.00	\$10,500.00	
		Diversion During Construction:						
		Assume need to pass 900 cfs canal flow during	1				·	
		construction. Assume load borrow.	·			!		
		Assume no dewwatering required.	·					
	11	Construct U/S & D/S earth cofferdams. (Height=15 ft)	D8120	2,000	CY	\$15.00	\$30,000.00	
		F&I impervious geomembrane on cofferdams.	D8120	350	ŞY	\$15.00	\$5,250.00	
		F&I three 9-ft dia. X .138-in galv., corrugated metal pipes	D8120	1,000	LF	\$500.00	\$500,000.00	
		btwn cofferdams. Wt/Ft= 210 lbs/ft.		1,025			4500,000,00	
	14	Remove cofferdams and diversion structures	D8120	1	LS	<u></u>	\$20,000.00	
					· · · · · · · · · · · · · · · · · · ·		·	
							<u>-</u>	
						f		
		Sheet Subtotal					\$1,119,690.00	
		QUANTITIES			P	RICES		
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1	EATURE: Slack Rock Assessment Study Sunnyside Canal Powerplant, Byapss, and Switchyard		PROJE		er Basin	Water Storage	Options
Sunnys	side Car	nal Powerplant, Byapss, and Switchyard	REGION	PN	PRICE	LEVEL:	Appraisal
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
-		Tailrace Channel (Unlined)			 -		
		Assume T.O. Rock El. 880			 		
	- 	Assume stockpile rock and common material for	TAUSA			ļ	
	15	Common excavation for tailrace channel	D8120	3,800	CY	\$5.00	\$19,000.0
	1	Rock excavation for tailrace channel (drill and shoot)	D8120	1,900	CY	\$45.00	\$85,500.0
		Furnish and place riprap bedding (1-ft depth)	D8120	700	CY	\$30.00	\$21,000.0
		Furnish and place riprap bedding (1-it depth)	D8120	1,400	CY	\$35.00	\$49,000.0
	-	Turnsii and prace riprap (2-it deput)	D6120	1,400		\$33.00	\$42,000.0
<u></u>	-	<u> </u>			<u> </u>	·	
ļ	-	Structural Excavation and Backfill					
	·	Assume T. O Rock El. 880.0				 	
		Assume stockpile rock for later use as riprap.					
	10	Common excavation for structures	D8120	12,800	CY	\$12.00	\$153,600.0
	+	Rock excavation for structures (drill & shoot)	D8120	18,150	CY	\$30.00	\$544,500.0
		Furnish backfill for structures (reuse excavation)	D8120	5,675	CY	\$6.00	\$34,050.0
	1 .				 	Included above	ł · · · · · · · · · · · · · · · · · · ·
ŀ	1	Place backfill around structures	D8120 D8120	5,675	CY		
		Compact backfill around structures	108120	5,675	CI	\$8.00	\$45,400.0
		Pipe Trench Excavation and Backfill					
	24	Common excavation for pipe in Service Yard	D8120	6,900	CY	\$10.00	\$69,000.0
	25	Rock Excavation for pipe in Service Yard	D8120	2,270	CY	\$45.00	\$102,150.0
	26	Furnish, place, & compact backfill for pipe (local)	D8120	6,425	CY	\$6.00	\$38,550.0
	27	Furnish & place soil cement for pipe	D8120	525	CY	\$75.00	\$39,375.0
	-						
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							<u></u>
i	1	Sitework Subtotal	<u> </u>				\$2,320,815.0
		QUANTITIES			Р	RICES	
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FEATI Black i		Assessment Study	PROJE		er Basin \	Water Storage	Options
Sunnys	ide Car	nal Powerplant, Byapss, and Switchyard	REGION	l PN	PRICE	LEVEL:	Appraisal
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
		STRUCTURAL				111111111111111111111111111111111111111	
l	1	Construct Concrete Tailrace Structure			<u> </u>		
		Furnish, form, and place reinforced concrete	D8120	560	CY	\$400.00	\$224,000.00
	1 '	2 Furnish and place concrete reinforcement.	D8120	72,800	1	\$1.00	
	 	Assume 130 #/CY			'		
	3	Furnish and handle cement (.282T/CY)	D8120	158	TONS	\$160.00	\$25,280.00
		Construct Powerplant Substructure					
 		Construct Powerplant Substructure Furnish, form, and place reinforced concrete	D8120	3 140	CY	\$400.00	\$1,256,000.00
			—— 	3,140		1	
<u> </u>		Furnish and place concrete reinforcement.	D8120	376,800	LBS	\$0.80	\$301,440.00
	6	Assume 120 #/CY Furnish and handle cement (.282T/CY)	D8120	885	TONS	\$140.00	\$123,900.00
	7	Construct Powerplant Superstructure	D8120	4,500	SF	\$100.00	\$450,000.00
		72.5-ft x 62-ft x 37-ft high superstructure					
		Structural steel superstructure with CMU walls.		 I			
		Stepped columns for 125T crane support		ı <u></u>		/ · · · · · · · · · · · · · · · · · · ·	
] " '	Built-up roof on metal roof deck.				l	
<u> </u>	ļ'	<u> </u>	\longrightarrow	 '	 	· '	
	-	Construct Byapss Substructure			 	<u> </u>	
	·· 8	Furnish, form, and place reinforced concrete	D8120	3,375	CY	\$400.00	\$1,350,000.00
	1	Furnish and place concrete reinforcement.	D8120	405,000	LBS	\$0.80	
	1	Assume 120 #/CY		700,000	100		\$747,000.00
	10	Furnish and handle cement (.282T/CY)	D8120	950	TONS	\$140.00	\$133,000.00
	1.1	Construct Bypass Superstructure	D8120	2,740	SF	\$100.00	\$274,000.00
<u> </u>	·	74.0-ft x 37-ft x 16-ft high superstructure	-		 		
ļ <u>.</u>	<u> </u>	Built-up roof on metal roof deck supported by open	+				
!	 /	web joists. CMU bearing walls. No crane.				· — —	
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	<u> </u>						
!	<u> </u> _J	Charles Parket			<u> </u>		
	<u></u>	Sheet Subtotal QUANTITIES	+		PF	RICES	\$4,534,420.00
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	FEATURE: Black Rock Assessment Study		PROJE	PROJECT:					
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Sunnys	ide Car	al Powerplant, Byapss, and Switchyard	REGION	PN	PRICE	LEVEL:	Appraisal		
Structur	al and a	Architectural	FILE:		nd Settings\bvanotte\Desktop\Black Rock\Black Rock SunnysidePP_1 Rev 1.xls Summary				
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
		STRUCTURAL (cont.)							
	<u> </u>			<u></u>		-			
	ļ	Construct Pipe Encasements		1.050	673./		#430,000,0		
	ł	Furnish, form, and place reinforced concrete	D8120	1,050	CY	\$400.00	\$420,000.0		
	13	Furnish and place concrete reinforcement.	D8120	115,500	LBS	\$1.00	\$115,500.0		
		Assume 110 #/CY	D8120	205	TONE	\$150.00	644.060.0		
	14	Furnish and handle cement (.282T/CY)	D8120	295	TONS	\$150.00	\$44,250.0		
		Structural Steel	120120	24.000	1.00		\$134 DDD 0		
	13	Furnish and install structural steel (painted):	D8120	34,000	LBS	\$4.00	\$136,000.0		
		Includes crane girder, rail, and hoist frames. Does not include typ, building framework.							
		Does not menue typ, building framework.	- i				·		
		Miscellaneous Metalwork							
	16	Furnish and install miscellaneous metalwork	D8120	15,000	LBS	\$7.00	\$105,000.00		
		Includes grating, hatches, ladders, guardrail, and	20.20	15,550	BDD	7			
		cable trays				1			
						"			
	17	Motor-operated, exterior insulated roll-up door	D8120	1	EA	\$10,000.00	\$10,000.00		
		18' x 20'					-		
	<u>.</u>								
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		Structural & Architectural Subtots	al				 \$5 365 170 00		
	I	QUANTITIES			P	RICES	\$5,365,170.00		
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	Total Pill.	M.R.O.Sha		Craig A. Grush		CHECKED \$p√	8/17/0/		
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Sunnyside Canal Powerplant, Byapss, and Switchyard Mechanical		REGION	PN	PRICE	LEVEL:	Appraisal		
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PLANT ACCOUNT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT	
		Major Mechanical Equipment						
	l	Turbine-Vertical Francis, 40485 Hp	D8420	200,000	LBS	\$20.00	\$4,000,000.0	
		400 rpm, 435 ft. Design Head						
		CF3 18-8 Stainless Runner 5.4' dia.	.					
	2	Digital Governor, 156,523 ftlbs.	D8420	1	EA	\$200,000	\$200,000.00	
		150 psi system		<u> </u>	[
		Governor Pressure Tank 875 Gal.	D8420	7,640	LBS	\$10.00	\$76,400.00	
		Look to Flaming Gorge Oil Tank						
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		Sheet Subtotal				· · ·	\$4.35C 400.00	
		QUANTITIES			PI	RICES	\$4,276,400.00	
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PLANT ACCOUNT	PAY ITEM		DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
		Furnish and instal	ll the following:							
		Steel Penstock:								
		Steel plate used for	r pipe fabrication:							
		ASTM A36: S			· =					
	†	(All pipe sizes are								
<u> </u>	4	144" Dia., 2 1/4" w	all, L= 252 ft.	D8420	890,000	LBS	\$2.00	\$1,780,000.0		
ļ	5	84" Dia., 1 5/16" w	all, L= 311 ft.	D8420	665,000	LBS	\$2.00	\$1,330,000.0		
	6	144" Dia., 3/4" wall	1, L= 132 ft.	D8420	155,000	LBS	\$2.00	\$310,000.0		
		Stainless Steel Still	ling Basin for Sleeve Valves:							
		ASTM 316L Stair				}				
	7	Two - 396" Dia., 1		D8420	295,000	LBS	\$15.00	\$4,425,000.0		
		with baseplates:								
		Each tank heig								
	ļ	Total weight fo	or both tanks = 295,000 lbs.							
		Sleeve valves with	hydraulic operators:							
	8	Two - 84" Dia. Inle	et X 72" Dia. Outlet Valves	D8420	140,000	LBS	\$15.00	\$2,100,000.0		
		ASTM 316L	Stainless steel plate							
		i	eight = 70,000					<u></u>		
<u> </u>		Total weight f	or both valves = 140,000 lbs.	1						
			ith hydraulic operators:	.						
ļ <u> </u>	9	Sleeve valve guard		D8420	120,000	LBS	\$10.00	\$1,200,000.0		
		Two - 60" Dia. Spho 60,000 lbs. per	erical valves with hydraulic operators valve							
	ļ									
		Turbine guard val				· · · · · - —				
	10		crical valve with hydraulic operator	D8420	115,000	LBS	\$10.00	\$1,150,000.0		
		115,000 lbs. pc	r valve							
-										
			Sheet Subtotal				DIOCO	\$12,295,000.00		
			DUANTITIES			۲	RICES	****		
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FEATURE: Black Rock Assessment Study				PROJECT: Yakima River Basin Water Storage Options						
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PLANT	PAY ITEM		DESCRIPTION		CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT	
	1									
	11		installing one 125-Ton		D-8410	153,000	LBS	\$6.00	\$918,000.0	
		overhead crane,	50' span				<u> </u>	!		
	12	Furnishing and	installing Hydraulic ele	evator	D-8410		unit	\$400,000	\$400,000.0	
	'-		pounds, travel = 31 ft.			•	<u> </u>	4		
			eed = 100 ft/min.				- 			
	1					 ·				
	13	Bulkhead gates	and guides at power pl	ant (steel)	D-8410	25,000	LBS	\$4.00	\$100,000.0	
		(assumes two ga	ites)							
							ļ			
	. 14	 	s for hulkhead gates, 2-	ton capacity	D-8410	400	LBS	\$50.00	\$20,000.0	
		(each hoist weig	ths 200 lbs)							
	15	Ruikhead gate 1	iftin beam & guides at	sleeve valve	D-8410	32,000	LBS	\$4.00	\$128,000.0	
	<u> </u>	pipe discharge to		MICCYC VALVO	D-0410		LDO	\$4.00	\$120,000	
		in the last committee of	(91001)							
	16	CO2 High Press	ure Fire Extinguishing	System:	D-8410	. <u></u>	L.S.		\$30,000.0	
		· -	ge Cylinders w/ control		·					
		and appurtenance	es and 300 lbs. of	•				· · · · · · · · · · · · · · · · · · ·		
		sch. 80 carbon s	teel pipe, valves & fitti	ngs						
	. 17	Fire Suppression	n System:		D-8410	1	L.S.		\$50,000.0	
		<u> </u>	w/ 100 feet of hose				ļ	: - 		
			nd-held 20# extinguish				<u> </u>			
	-		. 40 carbon steel pipe,	· · · · · · · · · · · · · · · · · · ·			.			
		1 - Fire pump, s	plit-case, 500 gpm @ 3	00 It of head						
 		Unit Cooling W	otor Custom		D-8410	1	T C		\$130,000 O	
[- 10		er pumps, end-suction t	vne 150 com	D-0410	1	L.S.	<u> </u>	\$130,000.00	
		†	atic, self-cleaning strai	• • • • • • • • • • • • • • • • • • • •						
		 	c K copper tubing, val							
			etile iron, mechanical ja							
	[-	
	19	Lubricating Oil	System:		D-8410	l	L.S.		\$20,000.00	
		2- 500 gal carbo	n steel storage tanks							
	<u> </u>	1 - 10 gpm @ 10								
	ļ	1 - lube oil filter							·	
		1,000 lbs. of sch	. 40 carbon steel pipe,	valves & fittings						
		<u></u>	Sheet Subtotal QUANTITIES				Di	RICES	\$1,796,000.00	
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FEATURE:		PROJECT:							
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Sunnys	side Car	al Powerplant, Byapss, and Switchyard	REGION	PN PN	PN PRICE LEVEL: Appraisal				
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PLANT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
					-				
	20	Compressed Air System:	D-8410		L.S.	+	\$50,000.0		
		2 - 100 cfm @ 125 psi rotary screw air compressors	D-0410	,	12.07.		φ50,000.0		
	+				 		l ——		
	1	1 - 250 gal, carbon steel air receiver	-						
	+	1 - 100 cfm air dryer	·						
	.	500 lbs. of sch. 40 carbon steel pipe, valves & fittings				 			
	21	Service Water System:	D-8410	1	L.S.		\$100,000.0		
	1	1 - Service water pump, 75 gpm @ 200 ft. of head				1			
	 	I - Hydropneumatic Tank, 300 gal.							
		750 lbs. of type K copper tubing, valves & fittings					· •		
	-	, post of production of the state of the sta				†			
	22	Gravity Drainage System:	D-8410	l	L.S.	†	\$50,000.0		
		12 - Floor drains, cast iron			1	 	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
		5.000 lbs. of cast iron hub & spigot, service weight			† •				
	 	soil pipe							
		1001 Prov.							
	23	Plant Unwatering System:	D-8410	 l	L.S.	-	\$70,000.00		
	+	2 - Vertical turbine type sump pump, 500 gpm @ 50 ft hd	0.110						
	-	1 - Drainage jet type drainage pump							
	1	1,000 lbs. of type K copper tube, valves & fittings							
		3,000 lbs. of ductile iron, mechanical joint pipe & fittings	i			-			
		5,000 hs. or dueme from mechanical joint pipe & mings			 				
	24	Domestic Water and Sanitary Waste System:	D-8410	1	L.S.		\$50,000.00		
		2 - Water Closets			1				
	-	I - Urinal	i i						
		2 - Lavatories & accessories							
	<u> </u>	I - Duplex Sewage Ejector	i			- · ·-			
		2,000 lbs. of cast iron hub & spigot service weight							
		sewer pipe			<u> </u>		 -		
	-	400 lbs. of type K copper tubing, valves & fittings	 						
	 	Sterning Ste	.				-		
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	1	Sheet Subtotal				 	\$320,000.00		
		QUANTITIES	İ		Þ	RICES	40,000.00		
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Sunnysi	ide Ca	nal Powerplant, Byapss, and Switchyard	REGION	N PN	PRICE	LEVEL:	Appraisal	
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PLANT ACCOUNT	PAYITEM	PROPRETION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT	
PL,	РАҮ	DESCRIPTION	Mari	Quart	0	UNIT	Алтасс	
	-	Heating, Ventilating, and Air Conditioning	D-8410	.1.	L.S.		\$934,000.00	
<u> </u>		Unmanned air cooled BUILDING AND VAULTS		····	+		+	
		OA temp 95 degrees F.				<u> </u>	<u> </u>	
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				i				
	Ĺ			L				
	<u> </u>	Mechanical Subtotal					\$19,621,400.00	
		QUANTITIES				RICES	· · · · · · · · · · · · · · · · · · ·	
вү	P Schleir	I 1.	BY C	raig A. Grush		CHECKED	N 4/17/04 ACD	
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Black Rock Assessment Study		Yakima River Basin Water Storage Options							
Sunnysid	de Can	nal Powerplant, Byapss, and Switchyard	REGION	PN	PRICE	LEVEL:	Appraisal		
Electrica			FILE: CADocuments and Settings\bvanotte\Desktop\Black Rock\Black I Revisions\BR_SunnysidePP_I Rev 1.xls\Summary						
PLANT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
	 				ļ				
	l	Electrical Generator (F&I)	D8430	I.	EA	\$1,700,000	\$1,700,000.00		
L 	†	30,000 kVA, 6,900 volts, 3-phase, 60 Hz				-	1		
	i.—.—	400 rpm, 95 % power factor							
		Vertical, synchronous machine			<u> </u>		ļ.		
	ļ	Static excitation system & voltage regulator			ļ		ļ		
	, 				<u> </u>	<u> </u>			
	<u> </u>				<u> </u>		1		
	_ 	Plant Grounding System (F&I)	D8430]				
	2	Ground rods, 10 ft, 3/4" dia, copper-clad		30	EA	\$180.00	\$5,400.00		
	j'	Stranded bare-copper conductor:			T	T			
	3			1,200	LF	\$5.50	\$6,600.00		
	4	4/0 AWG		800	LF	\$4.00	\$3,200.00		
	į 5	2/0 AWG		500	LF	\$3.50	\$1,750.00		
	6			800	LF	\$2.50	\$2,000.00		
		1700	1			*p ** -	***,****		
	i)				 		-		
	,	Generator Bus & Metal-Enclosed Switchgear (F&I)	D8430						
		Generator bus & Metal-Enclosed Switchgear (F&F) Generator non-segragated phase bus:	10000	250	LF	\$1,400.00	\$350,000.00		
			+	4.30	<u></u>	\$1,400.00	\$330,000.ca		
	į	15 kV, 3000 amperes, 3-phase, 60 Hz							
	8	Generator power circuit breaker:	1	1	EA	\$730,000	\$730,000.00		
		15 kV, 3000 amperes, 3-phase, vacuum type							
					ļ · · ·				
· ····	9	Station-service fused interrupter switch:		ı	EA	\$30,000.00	\$30,000.00		
	. ']	15 kV, 600 ampere, 3-phase, w/ power fuses	· · · · · · ·	·		ψ-/	***************************************		
		13 K1, 000 dispere, a pinae, or power races							
	, ,		+						
<u> </u>	! 	Generator Control Equipment (F&I)	D8430			 			
· ···						4300 000	#200 000 OU		
	I	Duplex control switchboard for operation of the		I	EA	\$300,000	\$300,000,000		
		generator			ļ		ļ		
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		Sheet Subtotal					\$3,128,950.00		
		QUANTITIES			PI	RICES			
	M. Schuh D8430	CHECKED L Rom	ву С	for: Elizabeth Tran		CHECKED BAD	V 8/17/04		
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FEATURE: Black Rock Assessment Study		Assessment Study	PROJECT: Yakima River Basin Water Storage Options					
Sunnys	side Car	al Powerplant, Byapss, and Switchyard	REGION	PN	PRICE	LEVEL:	Appraisal	
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PLANT ACCOUNT	РАҮПЕМ	DESCRIPTION	CODE	QUANTITY	UNIT	ENIT PRICE	AMOUNT	
		THE STATE OF THE S	D0420		 			
	1	Plant Battery System (F&I)	D8430		F.A.	#25 000 00	mas 000 n	
	- 11	125 volt, 300 ampere-hour, lead-acid battery		1	EA	\$25,000.00	\$25,000.0	
	$\frac{12}{12}$	<u> </u>	-	2	EA EA	\$8,000.00 \$12,500.00	\$16,000.0	
	13	DC distribution panelboard, 100 ampere mains, and molded-case circuit breakers			LA	\$12,300.00	\$12,500.0	
		Plant Station-Service Equipment (F&I)	D8430					
·		Indoor secondary unit substation with following features:						
	- J4			1	EA	\$55,000.00	\$55,000.0	
	15			5	EA	\$4,000.00	\$20,000.0	
		Building Lighting System (F&I) Interior luminaires	D8430					
	16			20	EA	\$700.00	\$14,000.0	
	10	480 volt, 1-phase			EA	3700.00	\$14,000.0	
 	17	Emergency lighting system		1	LS		\$900.0	
	1	Exterior luminaires						
	18	High-pressure sodium, wall-mounted, outdoor type 70 watt, 120 volt			EA	\$400.00	\$4,800.00	
		Building Fire Detection & Alarm System (F&I)	D8430	1	LS	·		
		Dunting Fire Detection to Atlanti System (F&1)	D0430	1		··· <u>-·</u>	\$150,000.00	
		Distribution Panelboards (F&I)	D8430					
	20	480-volts, 3-phase, 400 ampere bus, indoor type		2	EA	\$24,500.00	\$49,000.00	
		with molded-case circuit breakers						
		Motor Control Center (F&I)	D8430					
	21	480 volts, 3-phase, 1200 ampere main bus	ļ <u></u>	1	EA	\$110,000	\$110,000.00	
	<u> </u>	Four 20 inch wide sections					·	
				i			<u> </u>	
	-							
	 	Sheet Subtotal					\$457,200.00	
QUANTITIES		<u> </u>		P	RICES	ψ 12 7 2 200700		
BY	M. Schuh D8430	CHECKED L Romi	BY G	Gr.: Elizabeth Tran		CHECKED 130	N 8/17/04	
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Sunnys	side Car	nal Powerplant, Byapss, and Switchyard	REGION	PN	PRICE	LEVEL:	Appraisal	
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PLANT ACCOUNT	РАУ ПЕМ	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT	
					<u> </u>			
	 	Insulated Conductors (F&I)	D8430			+ +		
	ł	15 kV shielded power cable:	20130		İ			
ļ	22		<u> </u>	200	FT	\$12.00	\$2,400.0	
	1	7 4 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7		200	 		02,700.0	
	-	600-volt single-conductor, stranded-copper:						
	23			6,000	FT	\$0.65	\$3,900.0	
	24			4,000	FT	\$0.80	\$3,200.0	
	25			1,000	FT	\$1.55	\$1,550.0	
	26			1,000	FT	\$1.80	\$1,800.0	
	27			600	FT	\$2.90	\$1,740.0	
	28			600	FT	\$5.00	\$3,000.0	
					-			
		600-volt multi-conductor control cable:						
	29			1,500	FT	\$1.75	\$2,625.0	
	30	· · · · · · · · · · · · · · · · · · ·		2,000	FT	\$2.00	\$4,000.0	
	31			2,000	FΓ	\$1.80	\$3,600.0	
				<u></u>				
		·· ·						
		Conduit System (F&I)	D8430					
		Rigid steel conduit:						
	32			800	FT	\$14.00	\$11,200.00	
	33			500	FT	\$18.00	\$9,000.00	
	34	2 inch		500	FT	\$22.00	\$11,000.0	
	35	"		350	FT	\$30.00	\$10,500.00	
	1							
	1	Plastic-coated rigid steel:						
	36	2 inch		750	FT	\$30.00	\$22,500.00	
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	<u> </u>	Sheet Subtotal					\$92,015.00	
		QUANTITIES			Р	RICES		
BY	M. Schul	CHECKED L Rom'	ву С	1 For:		CHECKED		
<u> </u>	D8430	L Rom'		Elizabeth Tran		<i> }</i>	8/17/04	
DATE PR	EPARED	PEER REVIEW	DATE PREI	PARED		PEER REVIEW	V 8/17/04 VED-	
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PLANT	PAY ITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT		
		Bypass Structure Electrical System							
					<u> </u>				
		Service Equipment (F&I)	D8430	 					
<u> </u>	37	7 Distribution panelboard, indoor type	+	ļ i	EA	\$22,000.00	\$22,000.00		
	-	480 volts, 3-phase, 225 ampere bus, with molded-case circuit breakers			 				
<u> </u>		Transformer load center			<u> </u>				
	40) 15 kVA, 1-phase, 480-240/120			EA	\$11,000.00	\$11,000.00		
	_						<u>.</u>		
		Combination Motor Starters (F&I)	D8430	 	 		1:2 220 84		
<u> </u>	41	NEMA size 2 non-reversing contactor,		6	EA	\$7,000.00	\$42,000.00		
		480-120 volt control transformer		-	 				
	+	NEMA type 12 enclosure			-	+			
				-	 				
	<u> </u>	Building Lighting System (F&I)	D8430		<u> </u>	1			
	† 	Interior luminaires			† <u> </u>	<u> </u>			
	42	Fluorescent fixtures with two 4 foot lamps		8	ĖA	\$220.00	\$1,760.00		
	+	Exterior luminaires	<u>-</u>	<u> </u>	<u> </u>	<u> </u>			
	43			6	EA	\$400.00	\$2,400.00		
	<u> </u>	70 waii, 120 volt		<u> </u>	T				
<u> </u>		Insulated Conductors (F&I)	D8430						
		600 volt, single-conductor, stranded copper			T				
	44			600		\$0.60	\$360.00		
	45			400	+	\$0.70	\$280.00		
	46	5 8 AWG		100	FT	\$1.00	\$100.00		
		Conduit System (F&I)	D8430			<u> </u>			
<u> </u>	4	Rigid steel conduit	!		<u>.</u>	<u> </u>			
	47	7 1 inch		200	FT	\$15.00	\$3,000.00		
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							<u> </u>		
		121 salutant Calibrata			<u> </u>	ļ · · · · · · · · · · · · · · · · · · ·	** = C1 0 CE 00		
 		Electrical Subtotal QUANTITIES	_		<u> </u>	RICES	\$3,761,065.00		
BY	M. Schul		ву С	7 C.					
	D8430	Z Kem		Elizabeth Tran		801	8/17/04		
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FEATURE: Black Rock Assessment Study		PROJECT: Yakima River Basin Water Storage Options					
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		al Powerplant, Byapss, and Switchyard	WILE.	C:\Documents an		vanotte\Desktop\Bla	ck Rock\Black Rock
	ard and	Transmission Line		Revisions\ BR_S	unnysidePP.	_1 Rev 1.xis Summa	ry
PLANT ACCOUNT	PAYITEM	DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	<u> </u>						
		Switchyard					
	·	Furnish and Install:	D8440	1	EA	\$540,000	\$540,000.00
	<u> </u>	Oil-filled, conscrvator-type power transformer	D6440		EA	\$340,000	φυτο,οιοι
		40 MVA; 69-6.9kV, 3-phase		- "			
	2	69-kV disconnect switches, 1200 amp, 3-phase	D8440	2	EA	\$36,000.00	\$72,000.00
		69-kV circuit breakers, 1200 amp, 3-phase	D8440	1_	EA	\$200,000	\$200,000.0
					,.		
	ļ—	Tap at existing 69-kV line					
		Furnish and Install:					
		69-kV disconnect switches, 1200 amp, 3-phase		2	EA	\$36,000.00	\$72,000.00
	:	5 69-kV circuit breakers, 1200 amp, 3-phase	D8440	1	EA	\$200,000	\$200,000.00
	_						
		6 Construct Transmission Line	D8440	I	MILES	\$150,000	\$150,000.00
		Assume 1 mile of transmission line from					
		existing 69-kV line to the southwest		.	-		
		wood poles, 795 AWG conductor					,
ļ					 		
	-				1		
	+			1	T		
	<u> </u>						
	<u> </u>						
	 -/						
		Switchyard & Transmission Line	Subtotal				\$1,234,000.0
		QUANTITIES			Р	RICES	
BY L. Gamuc	ciello	CHECKED	ву <i>С</i>	Flizabeth Tran		CHECKED M	W 8/17/04
DATE P	REPARE	D PEER REVIEW	DATE PRI			PEER REVIEW	Das D
4/27/2004	4	James R. Zeiger	DATE PREPARED 08/17/04 CHECKED BOV 8/17/04 DATE PREPARED 08/17/04				NEW